BLACK HILLS MINERAL ATLAS, SOUTH DAKOTA: PART 1

(IN TWO PARTS)

BY BUREAU OF MINES STAFF, REGION V

* * * * * * * * * * **Information Circular 7688**

UNITED STATES DEPARTMENT OF THE INTERIOR
Douglas McKay, Secretary
BUREAU OF MINES
J. J. Forbes, Director

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by

Bureau of Mines Staff, Region V [1]

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1/ Mining Division, Rapid City Field Office.

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INTRODUCTION

The Black Hills Mineral Atlas briefly summarizes all pertinent data available on the mines and mineral deposits in the Black Hills that have been explored, developed, mined, or located.

The purpose of the atlas is threefold: First, from available data the general potentialities of the Black Hills region can be determined, although it is not possible to calculate actual ore reserves; second, it will provide the necessary basic information regarding a given property or commodity for further detailed study; and third, the compilation is a comprehensive directory of Black Hills deposits.

The atlas, admittedly, is not complete, as much information regarding early operations is extremely meager or missing entirely. Data on more recent operations are sometimes equally difficult to obtain. It is planned to review the atlas at periodic intervals to add information not available at present and to make descriptions of operating properties current. Interested persons having authentic information or data are invited to supply it to the Bureau of Mines in case of error in this tabulation or for additional information.

For convenience in compiling and reporting the data, the Black Hills region was divided into 4 areas. Areas A and B are discussed in this report, part 1, and areas C and D will be reported in a separate report, part 2.

ACKNOWLEDGMENTS

The atlas has been compiled over a period of 3 to 4 years by several of the staff of the Mining Division at Rapid City, S. Dak. Among those engaged in the compilation at various times were: Roswell W. Prouty, mining engineer; J. P. Gries and L. E. Shaffer, mineral technologists; A. B. Needham, formerly supervising engineer at Rapid City and now chief of the Mining Division, Region V. The descriptions were reviewed and assembled by D. H. Mullen, supervising engineer, Rapid City.

LOCATION AND PHYSICAL FEATURES

The Black Hills are situated in the western part of South Dakota, principally in Lawrence, Pennington, and Custer Counties, and extend into Crook and Weston Counties, Wyo. They cover an area approximately 100 miles long and 50 miles wide at the greatest dimension.

The Black Hills have been carved from a dome-shaped uplift. It is characterized by a hogback ridge that forms an outer rim, the Red Valley, a depression that extends entirely around the uplift, a limestone plateau with an infacing escarpment, and a central area of high ridges and tortuous valleys that culminate in Harney Peak

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at an altitude of 7,242 feet. Harney Peak is the highest elevation between the Mississippi River and the Rocky Mountains. Figure 1 shows the location of the Black Hills area.

Because of the rugged nature of the Black Hills, they are the source of many streams that have cut through the hogback and drain to the Belle Fourche River on the north and the Cheyenne River on the south and east. Both rivers are tributaries of the Missouri River. Areas outside the Black Hills are semiarid grazing lands with annual rainfall averaging 12 to 16 inches. Average rainfall at Spearfish, in the northern part of the Black Hills, is about 21 inches a year.

Temperatures are generally moderate and permit mining throughout the year, although short periods of subzero weather may occur during the winter months.

HISTORY AND PRODUCTION

Mining in the Black Hills began with the discovery of gold by a military expedition under the command of General George A. Custer, which was making a reconnaissance of the Black Hills, then a part of the Great Sioux Indian Nation. The discovery was made late in July 1874 near the present site of the town of Custer.

News of the discovery spread rapidly and, although the Sioux were hostile and military orders were issued forbidding prospecting, several parties succeeded in entering the forbidden area. The Gordon Party, consisting of 26 men, a woman, and a boy, was the largest and reached French Creek, near Custer, in December 1874. A stockade was built for protection against the Indians and 70 ounces of gold was recovered from placer deposits before the party was ejected by soldiers in April 1875. This was the first mining operation in the Black Hills.

Because of an insistent demand that the area be opened to prospectors, the Government attempted to negotiate with the Indians. When these negotiations failed, the military authorities withdrew their objections and prospecting was resumed, although it was accompanied by considerable bloodshed. A treaty was finally arranged between the Government and the Indians, and the area was ceded to the Government in September 1876. The Black Hills were legally opened to prospecting and settlement on February 28, 1877.

The first rush of gold seekers was toward Custer, but the placers proved low in grade and prospecting advanced north and east with the discovery of rich placers in Deadwood and around Nigger Hill in the northern Black Hills and at Rockerville in the eastern Black Hills. The first placer claim in the northern Black Hills was located on Deadwood Gulch on November 17, 1875. The discovery of placer gold led to the discovery of lode gold, and the first lode claims were the Grant and Old Abe located on December 11, 1875, which are now a part of the Homestake property.

During the first 10 years of mining, operations were under tremendous handicaps because of poor transportation. Machinery and supplies were freighted over long distances by ox team, and only the highest grade ores could be mined profitably. The Fremont, Elkhorn, & Missouri Valley Railway, now a part of the Chicago & Northwestern System, reached Buffalo Gap near the southern edge of the Black Hills in November 1885. It reached Rapid City the following year and entered Deadwood in December 1890. The Chicago, Burlington & Quincy Railway reached the Black Hills by way of Edgemont about the same time and entered Deadwood early in 1891. Branch lines were extended to mines in the northern Black Hills, and these facilities led to the opening of many important deposits. A branch line was built from Hill City

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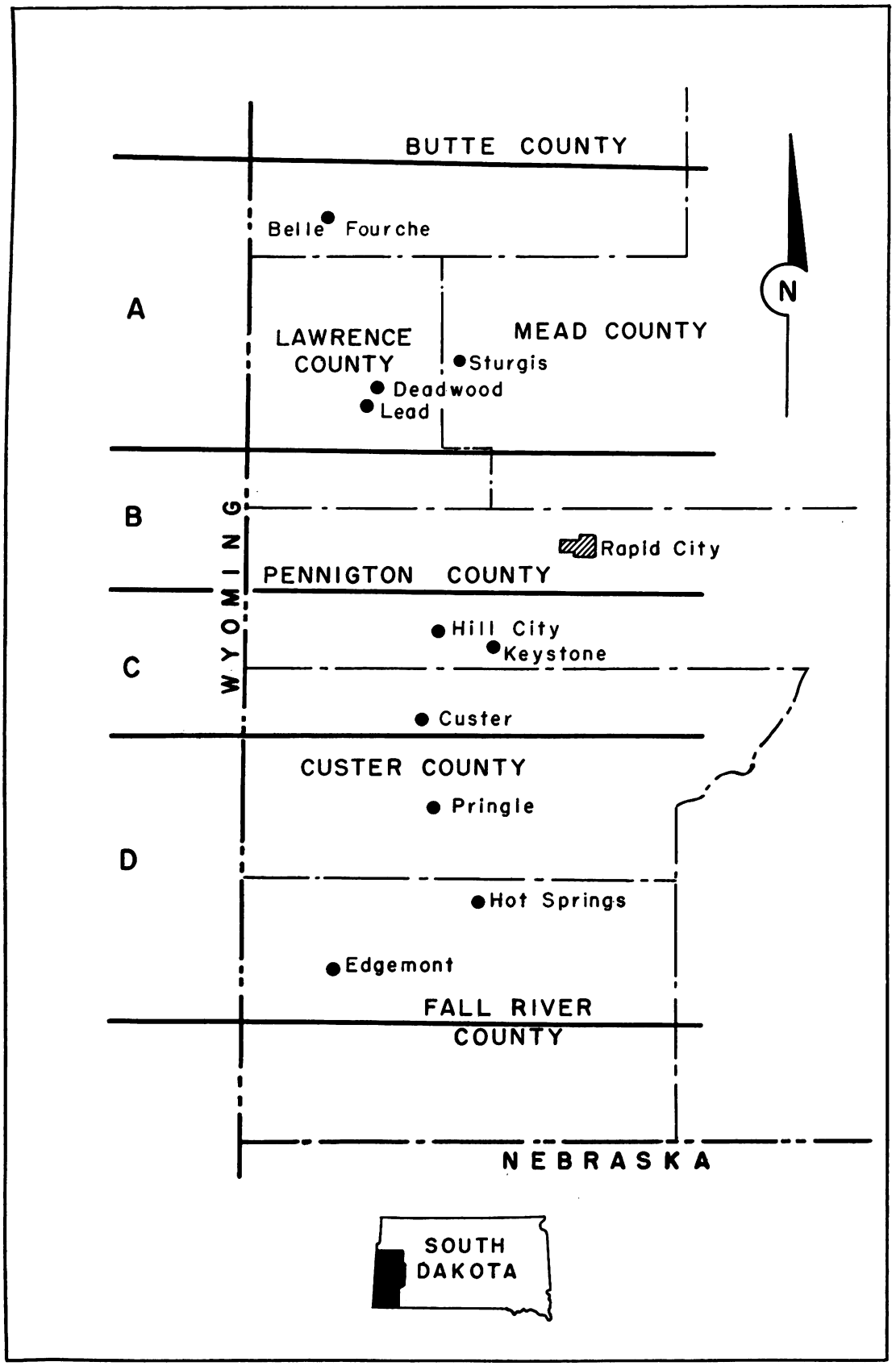

Figure 1. - Index map, Black Hills region, S. Dak.

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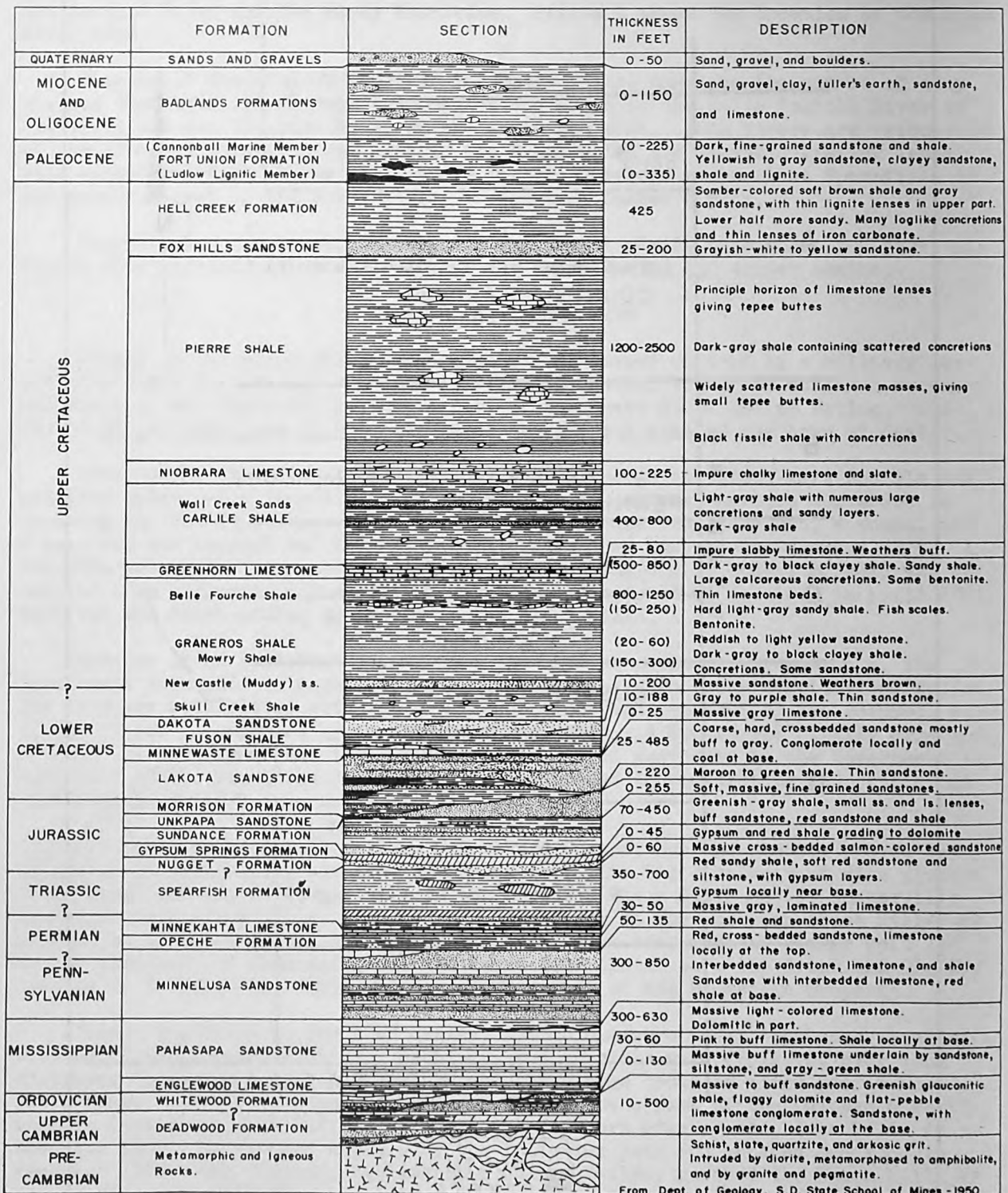

Figure 2. - Black Hills generalized columnar section.

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to Keystone and assisted in developing the central Black Hills. The Chicago & Northwestern Railway building westward from Pierre and the Chicago, Milwaukee & St. Paul Railway building westward from Chamberlain entered Rapid City in 1907.

Development of the northern Black Hills was rapid, the principal metal being gold. Some base metals have been produced, but the total is not impressive.

Pegmatite dikes, which occur in both the northern and southern Black Hills, but principally in the southern Black Hills, were exploited early when tin was discovered in placer concentrates in 1876. Cassiterite was found in-situ at the Etta mine at Keystone in 1883. A tin boom followed, and many small companies and one large company were formed to exploit the deposits. The largest company was the Harney Peak Tin Mining, Milling, & Manufacturing Co. This company secured control of most of the tin-bearing dikes but, because of the low grade of the deposits, failed in 1894. Tin production from all deposits has been about 180 tons.

Other pegmatite minerals have been mined almost continuously. Mica was first produced at the Crown mine near Custer in 1879. Other mines, such as the Etta near Keystone, have produced spodumene and other lithia minerals since 1895. Accessory minerals, such as beryl, rose quartz, and columbite-tantalite, have been recovered intermittently since 1914. The production of feldspar, which occurs abundantly in most of the pegmatites, began in 1923. It is now the most important of the pegmatite minerals produced, both in tonnage and in value.

Limestone, sandstone, gypsum, bentonite, and cement are mined and produced in considerable quantity and contribute substantially to the mineral production of the area.

Total production of minerals and mineral products in the Black Hills is given in table 1, and the production for 1951 is given in table 2.

GENERAL GEOLOGY

The Black Hills region is a truncated dome of Paleozoic and Mesozoic sedimentary rocks dipping gently outward from the center. A basement of pre-Cambrian metamorphic rocks has been exposed by erosion. The metamorphics have been intruded by the Harney Peak granite and by a host of small associated pegmatite dikes, all of pre-Cambrian age.

The metamorphic rocks were eroded enough to expose the Harney Peak granite before the beginning of Paleozoic deposition. During Paleozoic and Mesozoic time roughly 6,000 feet of sediments were laid down over the site of the present Black Hills. Doming at the end of the Mesozoic and at least two subsequent uplifts have permitted erosion to remove the entire sedimentary sequence and to carve the highest part of the Black Hills from the once deeply buried granite. Extensive igneous activity occurred in the northern Black Hills in early Tertiary time. Figure 2 shows a generalized columnar geologic section of the Black Hills.

COMPILATION OF THE ATLAS

Because of the many mineral properties it was found convenient to divide the Black Hills region into four parts, areas A, B, C, and D. Mineral properties in each of the areas were given a serial number containing the area designation.

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TABLE 1. - Total production of minerals and mineral products from the Black Hills[1]

Product	Period	Amount	Value
Gold	1876-1951	23,322,092 ozs.	$597,870,429
Silver	1876-1951	10,285,424 ozs.	7,440,743
Lead	1877-1951	485 tons	56,406
Zinc	1906-1951	265 tons	56,406
Copper	1897-1951	106 tons	36,466
Pegmatite minerals[2]	1879-1951	-	9,162,695
Tungsten (other than pegmatite)	1898-1950	-	1,347,852
Iron ore	1893-1950	68,804 long tons	310,767
Pyrite	? -1928	-	130,000
Arsenic	1924-1925	89 tons	7,167
Bentonite	1917-1951	-	17,115,496
Gypsum	1884-1948	350,176 tons	1,711,499
Sandstone (estimated)	1884-1950	-	[3]696,450
Limestone	1896-1950	-	4,913,798
Lime	1896-1949	186,951 tons	1,733,502
Cement	1925-1950	13,333,348 barrels	[3]20,640,519
Heavy clay products	? -1950	-	[3]1,077,549

1/ Bureau of Mines figure unless otherwise noted.
2/ Beryl, columbium-tantalum, feldspar, lithium minerals, mica, tin, tungsten, pollucite, andalusite-sillimanite, and rose quartz.
3/ Mineral Resources of South Dakota.

TABLE 2. - Production of minerals and mineral products in the Black Hills, 1951

Product	Amount	Value
Gold	458,101 ozs.	[1]$16,033,535
Silver	139,590 ozs.	[1]126,336
Iron ore	[2]12,601 tons	?
Pegmatite minerals[3]	62,816 tons	[2]1,066,745
Bentonite[4]	-	[2]1,766,522
Cement	1,020,868 barrels	[2]1,512,326
Limestone and lime	439,630 tons	[2]718,348
Brick and tile[5]	17,549 tons	[2]77,347

1/ Bureau of Mines figures unless otherwise noted.
2/ Mineral Resources of South Dakota.
3/ Beryl, columbium-tantalum, feldspar, lithium minerals, mica, and rose quartz.
4/ 1950 production, 1951 confidential.
5/ 1950 production, 1951 not available as separate figure.

Three indexes of mineral properties were prepared for each area, and those for areas A and B are contained in this report. The first index for each area is a list of the names of the mineral properties in alphabetical order and contains also the mineral commodity or commodities and serial number for each property. The second index is a list of mineral properties in numerical order, according to their serial numbers, and, in addition, contains the names and mineral commodities of the properties. The third index is a commodity index and contains the names and serial numbers of the mineral properties under their mineral or metal commodity.

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The indexes for each area are followed by descriptions of the properties for each area in the order of their serial numbers.

For each of the properties included in this atlas it would be desirable to have complete information as to location, ownership, commodity, geology, history, production, and bibliography. Because of a lack of information concerning older properties and because of limitations of space and time, obviously it was not possible to include all data on all properties listed. Emphasis has been placed on legal location, commodity or commodities produced or available, and upon complete references in the literature.

Location

This is the first attempt in compiling a list of the Black Hills mining properties with an accurate and legal location for each. Where possible the property has been located to the nearest quarter section. Larger holdings have been indicated by sections, or townships.

Ownership

Ownerships of mineral properties are included in this report where such information was available. As far as the larger producers are concerned, this information is reasonably reliable. But small properties change hands frequently, and older claims have reverted or are involved in litigation in many instances. In some cases no ownership has been listed; in other cases the name of the last known owner has been given. It is felt that, with accurate legal location of a property, any interested person can easily consult courthouse records for the current ownership.

Commodity

Properties are indexed by commodity regardless of whether or not shipments have actually been made. Listings of most metal mines are simple, but lists of pegmatite mines are complicated, since each may contain six or more potentially valuable minerals.

Geology

The geology has been covered in one to three sentences in most cases. An effort has been made to include the size, attitude, and type of mineralization. Further details must be obtained from the literature or from a field examination.

History

A majority of the properties listed are now only of historical interest. Many of them have been operated by several different companies or individuals. Where possible, the names of all such companies have been included in the historical sketch. Where claims have been relocated under new names, all known names are listed in the alphabetical index.

Production

Production figures for individual mines are difficult to obtain and are frequently incomplete and unreliable. They have been given where possible. They cannot be used as a guide to the current value of any property.

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Bibliography

The bibliography is the most complete, and perhaps the most valuable, part of the atlas. On most properties the bibliography is essentially complete; however, the literature contains dozens of references for well known mines, such as the Homestake, and only the more recent or complete are included in the atlas. These, in turn, usually contain very complete bibliographies.

Most of the information was obtained from government publications, particularly those of the Geological Survey and the Bureau of Mines. The bulletins and reports of the South Dakota School of Mines and Technology and the State Geological Survey furnished additional valuable information. Scattered references were found also in numerous well-known geological and mining periodicals. These are all readily available in most technical libraries.

More difficult to obtain are the reports of the State Mine Inspector and the State Planning Board. A complete file of the old Black Hills Mining Review and the Black Hills Industrial Review is available in the library of the School of Mines and Technology at Rapid City. Since the very numerous references in these local publications would congest the footnotes, much historical material has been taken from these sources without specific credit.

Nonconfidential information in the files of the Geological Survey and the Bureau of Mines has been drawn upon freely and often without credit. Unpublished theses and reports have usually been credited to the author in the text. Much information has been obtained orally from local persons interested in the compilation of this atlas.

AREA A

Geology

This area embraces all of the northern Black Hills and some of the adjacent prairie to the north. It includes Tps. 4 to 9 N., Rs. 1 to 7 E., and covers part of Lawrence, Meade, and Butte Counties, figure 3. Much of the geology of the area has been described by the Federal Geological Survey in Folios 164 (Belle Fourche), 209 (Newell), and 219 (central Black Hills) of the Geologic Atlas of the United States (16) and (17).2/

The area is drained by Spearfish, Whitewood, and Bear Butte Creeks, which flow north into the Belle Fourche River.

Pre-Cambrian Rocks

The pre-Cambrian rocks in the northern Black Hills consist of at least 20,000 feet of metamorphosed sediments, with minor amounts of basic intrusives. They appear as a highly folded series of phyllites and schists with interbedded quartzite and amphibolite. They are overlain unconformably by nearly flat lying Deadwood sandstone and are extensively intruded by dikes, sills, and laccoliths of Tertiary porphyry. A small remnant of rhyolite tuff and obsidian near Roubaix is the only evidence of volcanic activity in Quaternary time.

Minerals within the pre-Cambrian in the northern Black Hills include gold and silver in the Lead and Roubaix areas, pyrite and traces of copper in the graphitic schists near Lead and Deadwood, and fluorite near Deadwood.

2/ Underlined numbers in parentheses refer to publications listed in the bibliography at the end of this report.

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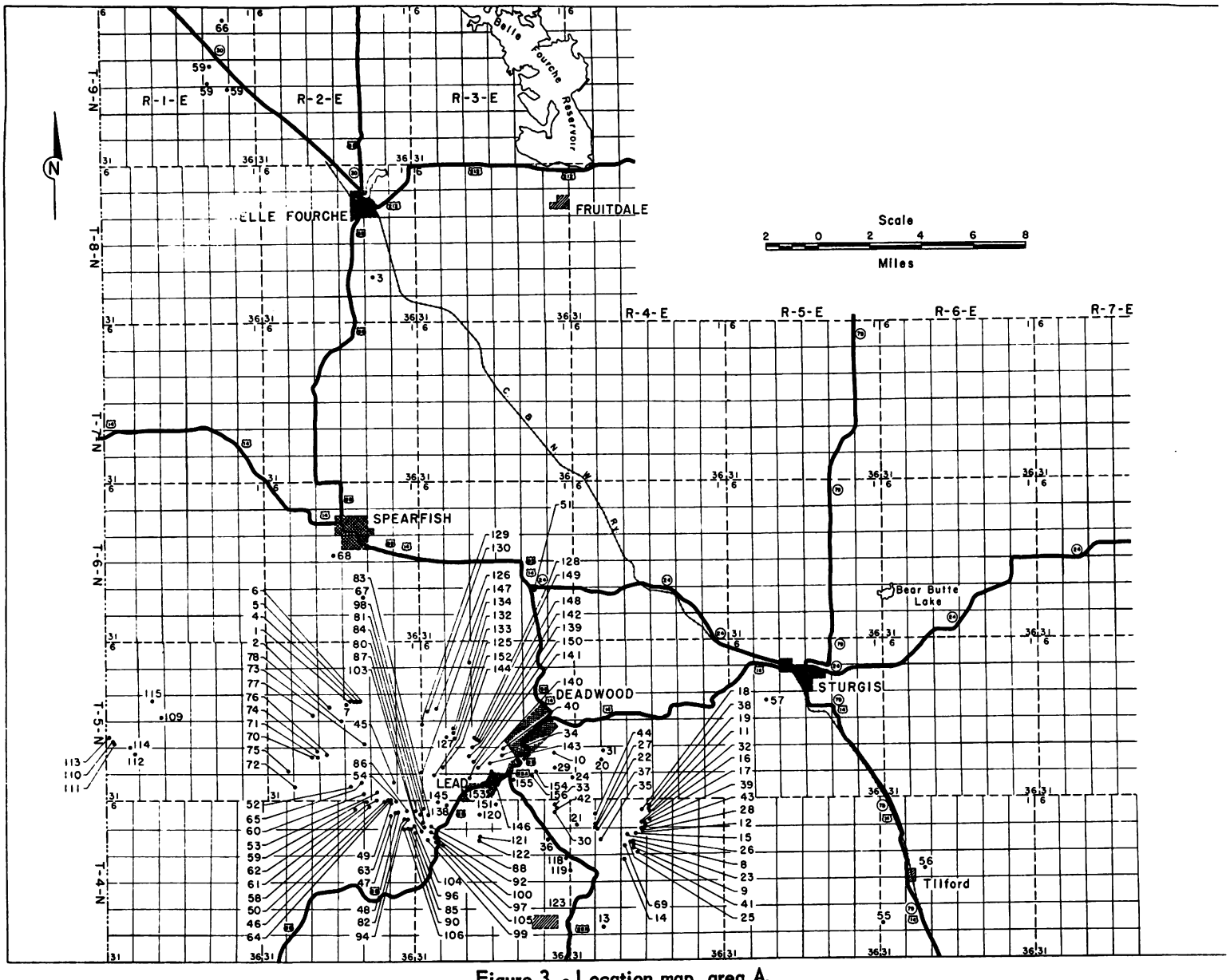

Figure 3. - Location map, area A.

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The detailed stratigraphy, structure, and mineralogy of the Lead area has been described by Paige (47), Allsman (1), Noble (40), and others.

In the vicinity of Tinton the pre-Cambrian is intruded by a series of pegmatites and quartz veins. These have been described in detail by Hess and Bryan (32) and by Smith and Page (60). Locally, they may carry feldspar, spodumene, tin, columbite-tantalite, and tungsten minerals.

Paleozoic Rocks

Cambrian System

Deadwood formation. - The Deadwood formation consists of up to 500 feet of sandstone, dolomite, and shale. In the northern Black Hills there is locally a basal conglomerate up to 20 feet in thickness, overlain by a thin but persistent basal sandstone or quartzite. There are two persistent dolomite zones, one just above the basal quartzite and the other near the top of the formation. These dolomites have been mineralized at numerous places and are locally called the lower and upper contacts. Within the Deadwood formation are found the gold-silver ores of the Bald Mountain, Maitland and Lead districts, the lead-silver ores at Galena, the lead-silver-zinc ores in Spruce Gulch, the tungsten deposits at Yellow Creek, Two Bit, and Deadwood, the iron oxide (pigment) at Two Bit and Strawberry Hill, and the pyrite (flux) of the Two Bit and Galena districts.

Ordovician System

Middle Ordovician rocks. In the northern Black Hills up to 85 feet of green shale, siltstone, and sandstone, formerly considered part of the Deadwood formation, is known to be of Middle Ordovician age. It has no economic value on the outcrop, though oil shows have been found in this sandstone in northwestern South Dakota.

Upper Ordovician Whitewood dolomite. - In the northern Black Hills up to 60 feet of buff dolomite is present. It feathers out to the south before the Pennington County line is reached. The dolomite was at one time quarried along Whitewood Creek for use as a flux in the Deadwood smelters, but it contained too much magnesium and its use was discontinued. Some dolomite has been used locally for building stone.

Mississippian System

Lower Mississippian Englewood formation. - The Englewood consists of 30 to 60 feet of purplish limestone. It is very argillaceous in its lower part, and at Deadwood it is underlain by about 20 feet of dark-gray shale. Because of its slabby nature, the Englewood has been used locally for building stone. The foundation of the Branch Mint mill at Galena was built entirely of Englewood blocks. Some mineralization in the Englewood was reported in the Cleopatra mine on Squaw Creek.

Middle Mississippian Pahasapa limestone. - This cliff-forming, light-gray limestone reaches a thickness of 630 feet in the northern Black Hills. It is the equivalent of the Madison limestone of the Rocky Mountain area.

The Pahasapa has been used as a flux in the smelters of the Deadwood area and has been burned for lime locally. Gold-silver ores occur as replacements in the limestone at Ragged Top and at Carbonate. In the latter area manganese is present also. North of the Black Hills the Pahasapa yields an abundance of warm artesian water.

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Pennsylvanian System

Minnelusa formation. - The Minnelusa consists of up to 500 feet of sandstone, dolomite, and shale in outcrops in the northern Black Hills. Anhydrite, not present on the outcrop, increases the thickness to 650 feet in subsurface. The formation carries artesian water north of the Black Hills.

Permian System

Opeche formation. - The Opeche consists of 90 to 110 feet of brick-red shale, presumably of Permian age. It is not utilized in the northern Black Hills.

Minnekahta limestone. - The Minnekahta consists of 40 to 60 feet of thin-bedded purplish limestone. It is crushed for aggregate at Spearfish, and has been burned locally for lime.

Mesozoic Rocks

Triassic System

Spearfish formation. - The Spearfish consists of 350 feet or more of red shale and is probably of Permo-Triassic age. Gypsum beds within the formation locally reach commercial thickness. At one time or another, the Spearfish gypsum has been used in the manufacture of plaster at Sturgis, Piedmont, Crook City (near Whitewood), and Spearfish.

Jurassic System

Nugget (?), Gypsum Springs, Sundance, Unkpapa, and Morrison formation. - This series reaches a thickness of 400 to 500 feet in the northern Black Hills. No commercial use has been made of any of these formations, though the Sundance sandstones furnish artesian water in Hay Creek, west of Belle Fourche.

Cretaceous System

Lakota sandstone. - The Lakota consists of up to 100 feet of sandstone, with minor beds of shale and some coal on the west side of the Black Hills. At one time a spur of the Northwestern Railroad extended west from Belle Fourche to near Aladdin, Wyo., to procure coal for railroad use. The Lakota has been quarried as a building stone at Sturgis and at Spearfish. It is the source of much of the artesian water around the north flank of the Black Hills.

Fuson formation. - The Fuson formation consists of varicolored clay with minor sandstone beds. It varies from 20 to 60 feet in thickness. The clay is used for manufacture of regular and face brick at Belle Fourche.

Dakota formation. - The Dakota sandstone varies from 40 to 80 feet in thickness in the northern Black Hills. It has been utilized locally as a building stone and is a source of artesian water, especially around Belle Fourche.

Graneros formation. - The Graneros, which reaches a total thickness of 800 to 1,000 feet, can be subdivided as follows:

Belle Fourche shale	350 - 500
Mowry siliceous shale	200 - 250
Newcastle sandstone	0 - 60
Skull Creek shale	200 - 250

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A nonswelling bentonite, which locally reaches a thickness of 30 feet, is being mined on the Wyoming side of the line west of Belle Fourche. It lies at the base of the Newcastle sandstone. The Newcastle sandstone produces oil in several fields along the west flank of the Black Hills, but, in spite of widespread test drilling around the north end of the area, no oil has been produced on the South Sakota side. The very important Belle Fourche or "Clayspur" bentonite lies at the top of the Mowry shale and is extensively mined around the northwest flank of the Black Hills from Belle Fourche, S. Dak., to Osage, Wyo.

Greenhorn limestone. - This 40- to 65-foot formation consists of limestone and calcareous shale. It has been used by ranchers for building foundations, bridge abutments, and as rip-rap on stock dams.

Carlile formation. - The Carlile consists of up to 450 feet of dark-gray marine shale with large concretions. It has no commercial use.

Niobrara formation. - The Niobrara consists of 200 to 250 feet of chalky shale, which has not been utilized in the Black Hills area.

Pierre formation. - The Pierre consists of up to 1,700 feet of dark-gray marine shale. It contains impure nonswelling bentonite, which reaches a local thickness of 2 feet. Several years ago an unsuccessful attempt was made to process this bentonite at Sturgis.

Fox Hills and Hell Creek formations. - These formations are not present in the area but cover extensive areas in the northwestern part of the State. Locally, the Fox Hills serves as an important water-bearing sand.

Cenozoic Rocks

Fort Union Formation

This formation, which covers a large area in the northwestern corner of the State, does not crop out in the area under consideration. It contains lignite beds up to 8 feet in thickness, which have supplied some local demand.

Oligocene-White River Formation

Clays of this age fill old valleys in the northern Black Hills. These clays have been prospected for ceramic value and as sources of alumina.

Tertiary Intrusives

Widespread igneous activity in the northern Black Hills is represented by many dikes, sills, stocks, and laccoliths of Tertiary porphyry. These carry gold near Lead and on Strawberry Hill. The rock is crushed for aggregate and road metal at Lead.

Quaternary and Recent

Gravels of relatively recent origin occur in present stream valleys and in terraces at several levels above the present drainage. They have yielded placer gold, tin, tungsten, and columbite-tantalite in the northern Black Hills.

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Alphabetical index, Area A

Name	Commodity	Serial No.
Adelphi	Silver, gold, lead.	A-1
Ak-Sar-Ben claim (Reliance)	Gold, silver.	See A-62
Alameda	do.	A-49
Alder Creek Gold Mining Co	Gold, silver, tungsten.	A-121
Alexander	Lead, silver.	A-8
Alice	Silver, lead.	A-9
Alpha-Platus	Gold, silver.	A-80
American Colloid Co	Bentonite.	A-59
American Eagle	Gold, silver.	A-45
American Express	do.	A-125
American Mining Co	do.	A-70
Anaconda (Clover Leaf) (Uncle Sam)	Gold	See A-13
Anaconda	Gold, silver.	A-123
Anchor (Balmoral group)	do.	See A-71
Anchor Mountain	Gold.	A-44
Anna (Lexington Hill)	Gold, silver.	See A-29
Apex	do.	A-46
Bald Mountain Mining Co	do.	A-50
Balmoral Group	do.	A-71
Baltimore and Deadwood claim (Esmeralda)	do.	See A-142
Baltimore mine	do.	A-47
Beaver Creek Mining Co	Tin.	A-109
Belle Eldridge Gold Mines	Gold, silver, lead, zinc.	A-10
Belle Fourche Bentonite Products Co	Bentonite.	A-66
Ben Hur mine	Gold, silver.	A-48
Big Bonanza mine	do.	A-81
Big Red claim (Minnesota Group)	do.	See A-130
Billie (Isadorah)	do.	See A-92
Bingham claim (Hidden Fortune)	Tungsten, gold, silver.	See A-141
Bion Fraction (Bion mine)	Gold, silver, pyrite.	See A-69
Bion mine	do.	A-69
Bismark (Globe)	Gold, silver.	A-138
Black Diamond (Spearfish Gold Mining Co.)	do.	See A-75
Black Hills and Denver (Lexington Hill)	do.	See A-29
Black Hills Clay Products Co	Clay, brick.	A-3
Black Hills Tin Co	Tin.	A-110
Boscobel and Double Standard	Gold, silver.	A-82
Branch Mint	Silver, lead.	A-11
Brunnett claim (Hidden Fortune)	Tungsten, gold, silver	See A-141
Bullion	Silver, lead.	A-12
Bunker Hill claim (Reliance)	Gold, silver	See A-62
Burlington & Golden Sands	do.	A-50
Buxton	do.	A-83
Caledonia claim (Homestake)	Gold, silver, tungsten.	See A-153
Canyon Corp	do.	A-126
Carbonate Consolidated Mines, Inc	Gold, silver, lead.	A-5
Carroll	Gold, silver	A-127

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Name	Commodity	Serial No.
Champion (Lexington Hill)	Gold, silver.	See A-29
Chance (Imperial)	do.	See A-125
Chico claim (Bion mine)	Gold, silver, pyrite.	See A-69
Cleopatra	Gold, silver.	A-2
Clinton	do.	A-84
Clinton (Bald Mountain Mining Co.)	do.	A-50
Clover Leaf (Uncle Sam, Anaconda)	Gold.	A-13
Cole Construction Co	Limestone.	A-51
Coletta	Silver, lead.	A-14
Columbus	Gold, silver.	A-139
Comstock (S.R.Smith, Two Bit)	Tungsten.	See A-42
Cora	Lead, silver.	A-15
Costello claim (Imperial)	Gold, silver.	See A-125
Costello Fraction (Imperial)	do.	See A-125
Crown Hill	do.	A-52
Cutting claim (Gladiator)	do.	See A-144
Custer	Silver, lead.	A-16
Dacy group	Gold, silver.	A-70
Daisy	do.	A-85
Dakota group	do.	A-53
Dakota Maid (Gilt Edge)	do.	See A-22
Dakota Tin & Gold Co	Tin.	See A-112
Dark Horse & General Grant	Gold, silver.	A-86
Dauntless claim (Minnesota group)	do.	See A-130
Deadbroke mine	do.	A-128
Deadwood-Golden Terra claim (Deadwood Terra)	do.	See A-140
(Homestake)	Gold, silver, tungsten.	See A-153
Deadwood-Heidelberg (Mascot)	Gold.	See A-31
Deadwood Standard Gold Mining and Milling Co	Gold, silver.	A-72
Deadwood-Terra	do.	A-140
Decorah mine	do.	A-54
Dividend mine	do.	A-54
Dolphin (Imperial)	do.	See A-125
Double Rainbow	Silver, lead.	A-17
Double Standard (Golden Reward Gold Mining Co.)	Gold, silver.	See A-88
Durango mine	Gold, silver, tungsten.	A-141
Eagle Bird	Gold, silver.	A-73
Eagle No. 4 claim (Elliptic Mining Co.)		See A-134
Echo	Fluorite.	A-129
Eilenberg Fraction (American Mining Co.)	Gold, silver.	See A-70
Elliptic Mining Co		A-134
El Refugio	Silver, lead.	A-18
Empire State mine	Gold, silver.	A-50
Esmeralda	do.	A-142
Etta	Tungsten, gold.	A-120
Eureka (Hoodoo-Union Hill)	Gold, silver.	See A-27
Eva H and Silver Tongue	do.	A-74
Fannie	do.	A-87

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Name	Commodity	Serial No.
Father De Smet claim (Homestake)	Gold, silver, tungsten.	See A-153
Flora E (Dacy group)	Gold, silver.	See A-70
Florence	Silver, lead.	A-19
Folger	Gold, silver.	A-49
Frerichs Mining Co	do.	A-154
Garden City	do.	A-130
Gentle Annie	do.	A-143
Giant-Volney	Tin.	A-111
Gilmore mine (Montezuma and the Whizzers)	Gold, iron sulfide.	See A-34
Gilt Edge mine	Gold, silver.	A-22
Gladiator (Cutting)	do.	A-144
Globe (Bismark)	do.	See A-138
Glover	do.	A-145
Golden Crest	do.	A-21
Golden Crown claim (Hidden Fortune Gold Mining Co.)	Tungsten, gold, silver.	See A-141
Gold Mountain Mining Co	Gold, silver.	A-20
Golden Reward	do.	A-88
Golden Reward Gold Mining Co	do.	A-88
Gossan Claim (American Mining Co.)	do.	See A-70
Gossan Fraction (American Mining Co.).	do.	See A-70
Gotland (Olaf Seim)	Pyrite, gold.	See A-40
Grand View (Double Rainbow, Richmond-Sitting Bull)	Silver, lead	See A-17
Grant Reddy claim (Hidden Fortune Gold Mining Co.)	Tungsten, gold, silver.	See A-141
Great Mogul mine	Gold, silver.	A-96
Greenough (Imperial)	do.	See A-125
Grenville claim (American Mining Co.).	do.	See A-70
Groshong	Silver, lead.	A-23
Gulch (Double Rainbow) (Richmond-Sitting Bull)	do.	See A-17
Gunnison and Vulcan	Gold, silver.	A-58
Gustin and Redemption Group (Jupiter).	do.	See A-148
Hardin Properties	Gold, pyrite, iron.	A-24
Hardscrabble	Gold, silver.	A-90
Harmony	do.	A-90
Harrison mine	Tungsten, gold.	A-141
Hawkeye-Pluma	Gold, silver.	A-146
Hayes (Rutherford B.)	Silver, lead.	A-25
Helen Gould (Belle Eldridge)	Gold, silver, lead, zinc.	See A-10
Hermitage (Spearfish Gold Mining Co.).	Gold, silver.	See A-75
Hester A	Silver, lead.	A-26
Hidden Fortune Gold Mining Co	Tungsten, gold, silver.	A-141
Hidden Treasure group	Gold, silver.	A-147
Highland claim (Homestake)	Gold, silver, tungsten.	See A-153
Highland Chief (Lexington Hill)	Gold, silver.	See A-29
Highland Mary (Lexington Hill)	do.	See A-29
Hoffman Iron Deposit	Iron.	A-119
Homestake Limestone Quarry	Lime.	A-55

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Name	Commodity	Serial No.
Homestake Mining Co.....	Gold, silver, tungsten.	A-153
Homeward Bound claim (Dakota Tin and Gold Co.).....	Tin.	See A-112
Hoodoo-Union Hill group.....	Gold, silver.	A-27
Horseshoe-Comet.....	Gold, silver, lead, pyrite.	A-28
Imperial.....	Gold, silver.	A-125
Iron Hill.....	Gold, silver, lead.	A-4
Iowa claim (Hidden Fortune Gold Mining Co.).....	Tungsten, gold, silver.	See A-141
Iron Duke claim (Reliance).....	Gold, silver.	See A-62
Isadorah.....	do.	A-92
Iva claim (American Mining Co.).....	do.	See A-70
Iva Fraction (American Mining Co.)...	do.	See A-70
Jim claim (Dakota group).....	do.	See A-53
John White Property (Dakota Tin and Gold Co.).....	Tin.	See A-112
Joseph claim (Dakota group).....	Gold, silver.	See A-53
Juno.....	do.	A-60
Jupiter.....	do.	A-148
Kangaroo claim (Gladiator).....	do.	See A-144
Katie claim (Reliance).....	do.	See A-62
Keenan properties.....	Gold, tungsten, tin, tantalum.	A-112
Kicking Horse.....	Gold, silver.	A-132
Lehigh claim (Bion mine).....	Gold, silver, pyrite.	See A-69
Leopard & Jessie Lee.....	Gold, silver.	A-50
Lewis lime plant.....	Lime.	A-67
Lexington Hill...	Gold, silver.	A-29
Lineal Lodes (Beaver Creek Mining Co.)	Tin.	See A-109
Little Blue (Alder Creek).....	Gold, silver, tungsten.	See A-121
Little Bonanza.....	Gold, silver.	A-81
Little Rock claim (Dakota group).....	do.	See A-53
Little Tornado.....	do.	A-94
Lor Mining Co.....	Iron.	A-118
Lucy claim (Dakota group).....	Gold, silver.	See A-53
Lundberg, Dorr & Wilson.....	do.	A-83
Maggie claim (Fannie).....	do.	See A-87
Mark Twain.....	do.	A-50
Mary group.....	Tungsten.	A-30
Mascot Mining Co.....	Gold.	A-31
Merritt and Merritt No. 2.....	Gold, silver, lead.	A-32
Metallic Streak.....	Gold, silver.	A-75
Minerva.....	do.	A-149
Minnesota.....	do.	A-130
Mogul Horseshoe Co.....	do.	A-96
Monarch.....	do.	A-33
Monday group.....	do.	A-50
Monitor mine.....	do.	A-143
Monitor claim (Reliance).....	do.	See A-62
Mono claim (Dakota group).....	do.	See A-53
Montezuma and the Whizzers.....	do.	A-34
Moulton claim (Hardin).....	Gold, pyrite, iron.	See A-24

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Name	Commodity	Serial No.
National Gold & Silver Co.....	Gold, silver.	A-97
New Silver Queen (Silver Queen).....	Silver, lead.	See A-41
Norwich claim (American Mining Co.)...	Gold, silver.	See A-70
Olaf Seim.....	Pyrite, gold.	A-40
Ofer (Monday group).....	Gold, silver.	See A-50
Old Ironsides.....	do.	A-78
Omega mine.....	do.	A-150
Ophir (Lexington Hill).....	do.	See A-29
Oro Fino.....	Gold.	A-35
Oro Hondo.....	Gold, silver.	A-151
Orre Cache (Lexington Hill).....	do.	See A-29
Pansy (Alder Creek).....	Gold, silver, tungsten.	See A-121
Pennsylvania.....	Gold, silver.	A-152
Perseverance.....	do.	A-50
Phoenix group (Dead Broke group).....	do.	See A-128
Pinny.....	do.	A-150
Portland.....	do.	A-61
Power (Mary group).....	Tungsten.	See A-30
Power No. 2 (Mary group).....	do.	See A-30
Puggy claim (Dakota group).....	Gold, silver.	See A-53
Puritan.....	Silver, lead.	A-36
Queen (Silver Queen).....	do.	See A-41
Queen of the Hills.....	Gold, silver.	A-156
Rattlesnake Jack.....	Gold.	A-37
Red Cloud.....	Silver, lead.	A-38
Rehl (Dakota group).....	Gold, silver.	See A-53
Reindeer (Monday group).....	do.	See A-50
Richmond (Baltimore).....	do.	See A-47
Richmond-Sitting Bull (Double Rainbow)	Silver, lead.	See A-17
Reliance.....	Gold, silver.	A-62
Retriever.....	do.	A-98
Ross Hannibal.....	do.	A-99
Rough and Ready.....	Tin, lithium, feldspar.	A-113
Rua group (Two Johns).....	Gold, silver.	See A-65
Ruby Belle.....	do.	A-100
Savage.....	Silver, lead.	A-39
Seabury-Calkins.....	Gold, silver, lead.	A-5
Segregated Iron Hill.....	do.	A-6
Silver Fraction (Little Tornado).....	Gold, silver.	See A-94
Silver Queen.....	Silver, lead.	A-41
Silver Terra (Double Rainbow) (Richmond-Sitting Bull).....	do.	See A-17
Sir Roderick Dhu (Columbus).....	Gold, silver.	See A-139
Slavonian.....	Pyrite.	A-155
Snowstorm.....	Gold, silver.	A-63
South Golden Reward.....	do.	A-88
Spanish R.....	Silver, gold.	A-7
Spearfish and Centaur.....	Tin.	A-114
Spearfish Gold Mining Co.....	Gold, silver.	A-75
Spearfish Sandstone Quarry.....	Sandstone.	A-68
S R. Smith.....	Tungsten.	A-42

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Alphabetical index (Con.)

Name	Commodity	Serial No.
Stewart	Gold, silver.	A-88
St. Patrick claim (Hidden Fortune Gold Mining Co.)	Tungsten, gold, silver.	See A-141
Sturgis sandstone quarry	Sandstone.	A-57
Sula claim (Hidden Fortune Gold Mining Co.)	Tungsten, gold, silver.	See A-141
Sundance	Gold, silver.	A-103
Swamp Eagle claim (Hidden Fortune Gold Mining Co.)	Tungsten, gold, silver.	See A-141
Tiger claim (Dakota group)	Gold, silver.	See A-53
Tiger Tail (Double Rainbow) (Richmond-Sitting Bull)	Silver, lead.	See A-17
Tornado	Gold, silver.	A-104
Trojan	do.	A-64
Two Bit No. 1 and No. 2 (S. R. Smith)	Tungsten.	See A-42
Two Johns	Gold, silver.	A-65
Ulster	Gold, silver.	A-76
Uncle Sam (Clover Leaf) (Anaconda)	Gold.	See A-13
Union mine	Gold, silver.	A-105
University claim (Reliance)	do.	See A-62
Upper Welcome	do.	A-106
U. S. Gypsum Co	Gypsum.	A-56
Victoria	Gold, silver.	A-77
Vulcan claim (Dakota group)	do.	See A-53
Vulcan (Gunnison)	do.	See A-58
War Eagle	Silver, lead.	A-43
Wasp No. 2 (Little Blue)	Tungsten, gold, silver.	A-122
Wedge claim (Dakota group)	Gold, silver.	See A-53
Welcome (Mogul-Horseshoe Co.)	do.	See A-96
Wells Fargo	do.	A-133
Winner Mining Co	Gold, silver, tin.	A-115
Winneshiek (Imperial)	Gold, silver.	See A-125
Winnie F. claim (Gladiator)	do.	See A-144
Yellow Jacket (S. R. Smith) (Two Bit).	Tungsten.	See A-42

Numerical index

Serial No.	Name	Commodity
A-1	Adelphi	Gold, silver, lead.
A-2	Cleopatra	Gold, silver.
A-3	Black Hills Clay Products Co	Clay, brick.
A-4	Iron Hill	Gold, silver, lead.
A-5	Carbonate Consolidated Mines, Inc	Do.
A-5	Seabury-Calkins	Do.
A-6	Segregated Iron Hill	Do.
A-7	Spanish R	Gold, silver.
A-8	Alexander	Lead, silver.
A-9	Alice	Do.
A-10	Belle Eldridge Gold Mines	Gold, silver, lead, zinc.

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Numerical index (Con.)

Serial No.	Name	Commodity
A-11	Branch Mint	Silver, lead.
A-12	Bullion	Do.
A-13	Clover Leaf (Uncle Sam, Anaconda)	Gold.
A-14	Coletta	Silver, lead.
A-15	Cora	Do.
A-16	Custer	Do.
A-17	Double Rainbow (Richmond-Sitting Bull)	Do.
A-18	El Refugio	Do.
A-19	Florence	Do.
A-20	Gold Mountain	Gold, silver.
A-21	Golden Crest	Gold, silver.
A-22	Gilt Edge	Do.
A-23	Groshong	Silver, lead.
A-24	Hardin properties	Gold, pyrite, iron.
A-25	Hayes (Rutherford B.)	Silver, lead.
A-26	Hester A	Do.
A-27	Hoodoo-Union Hill	Gold, silver.
A-28	Horseshoe Comet	Gold, silver, lead, pyrite.
A-29	Lexington Hill	Gold, silver.
A-30	Mary group	Tungsten.
A-31	Mascot (Deadwood-Heidelberg)	Gold.
A-32	Merritt and Merritt No. 2	Gold, silver, lead.
A-33	Monarch (Black Hills Mining Co.)	Gold, silver.
A-34	Montezuma and the Whizzers	Gold, iron sulfide.
A-35	Oro Fino	Gold.
A-36	Puritan	Silver, lead.
A-37	Rattlesnake Jack	Gold.
A-38	Red Cloud	Silver, lead.
A-39	Savage	Do.
A-40	Olaf Seim	Pyrite, gold.
A-41	Silver Queen	Silver, lead.
A-42	S. R. Smith (Two Bit)	Tungsten.
A-43	War Eagle	Silver, lead.
A-44	Anchor Mountain	Gold.
A-45	American Eagle	Gold, silver.
A-46	Apex	Do.
A-47	Baltimore mine	Do.
A-48	Ben Hur mine	Do.
A-49	Alameda	Do.
A-49	Folger	Do.
A-50	Bald Mountain Mining Co	Do.
A-50	Burlington and Golden Sands	Do.
A-50	Clinton (Bald Mountain Mining Co.)	Do.
A-50	Perseverance	Do.
A-50	Monday group	Do.
A-50	Mark Twain	Do.
A-50	Leopard and Jessie Lee	Do.
A-50	Empire State mine	Do.
A-51	Cole Construction Co	Limestone.
A-52	Crown Hill	Gold, silver.
A-53	Dakota group	Do.
A-54	Decorah mine	Do.

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Serial No.	Name	Commodity
A-54	Dividend	Gold, silver.
A-55	Homestake Limestone Quarry	Lime.
A-56	U. S. Gypsum Co	Gypsum.
A-57	Sturgis Sandstone Quarry	Sandstone.
A-58	Gunnison and Vulcan	Gold, silver.
A-59	American Colloid Co	Bentonite.
A-60	Juno	Gold, silver.
A-61	Portland	Do.
A-62	Reliance	Do.
A-63	Snowstorm	Do.
A-64	Trojan	Do.
A-65	Two Johns	Do.
A-66	Belle Fourche Bentonite Products Co	Bentonite.
A-67	Lewis lime plant	Lime.
A-68	Spearfish sandstone quarry	Sandstone.
A-69	Bion mine	Gold, silver, pyrite.
A-70	American Mining Co	Gold, silver.
A-70	Dacy group	Do.
A-71	Balmoral group	Do.
A-72	Deadwood Standard Gold Mining & Milling Co	Do.
A-73	Eagle Bird	Do.
A-74	Eva H and Silver Tongue	Do.
A-75	Spearfish Gold Mining Co	Do.
A-75	Metallic Streak	Do.
A-76	Ulster	Do.
A-77	Victoria	Do.
A-78	Old Ironsides	Do.
A-79	Undeveloped Prospect	
A-80	Alpha-Platus	Gold, silver.
A-81	Big Bonanza	Do.
A-81	Little Bonanza	Do.
A-82	Boscobel and Double Standard	Do.
A-83	Buxton	Do.
A-83	Lundberg, Dorr and Wilson	Do.
A-84	Clinton	Do.
A-85	Daisy	Do.
A-86	Dark Horse and General Grant	Do.
A-87	Fannie	Do.
A-88	Golden Reward	Do.
A-88	Golden Reward Gold Mining Co	Do.
A-88	South Golden Reward	Do.
A-88	Stewart	Do.
A-89	Undeveloped Prospect	
A-90	Hardscrabble	Gold, silver.
A-90	Harmony	Do.
A-91	Undeveloped Prospect	
A-92	Isadorah	Gold, silver.
A-93	Undeveloped Prospect	
A-94	Little Tornado	Gold, silver.
A-95	Undeveloped Prospect	

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Serial No.	Name	Commodity
A-96	Mogul-Horseshoe Co.	Gold, silver.
A-96	Great Mogul mine	Do.
A-97	National Gold and Silver Co.	Do.
A-98	Retriever	Gold, silver
A-99	Ross Hannibal	Do.
A-100	Ruby Belle	Do.
A-101	Undeveloped prospect	
A-102	Undeveloped prospect	
A-103	Sundance	Gold, silver.
A-104	Tornado	Do.
A-105	Union mine	Do.
A-106	Upper Welcome	Do.
A-107	Undeveloped prospect	
A-108	Undeveloped prospect	
A-109	Beaver Creek Mining Co.	Tin.
A-110	Black Hills Tin Co.	Do.
A-111	Giant-Volney	Do.
A-112	Keenan Property	Do.
A-113	Rough and Ready	Tin, lithium, feldspar.
A-114	Spearfish and Centaur	Tin.
A-115	Winner Mining Co. (Abundance Mining Co.)	Gold, silver, tin.
A-116	Undeveloped prospect	
A-117	Undeveloped prospect	
A-118	Lor Mining Co.	Iron.
A-119	Hoffman iron deposit	Do.
A-120	Etta	Tungsten, gold.
A-121	Alder Creek Gold Mining Co.	Gold, silver, tungsten.
A-122	Wasp No. 2 (Little Blue)	Tungsten, gold, silver.
A-123	Anaconda	Gold, silver.
A-124	Undeveloped prospect	
A-125	American Express	Gold, silver.
A-125	Imperial	Do.
A-126	Canyon Corp	Do.
A-127	Carroll	Do.
A-128	Deadbroke mine	Do.
A-129	Echo Group	Fluorite.
A-130	Garden City	Gold, silver.
A-130	Minnesota	Do.
A-131	Undeveloped prospect	
A-132	Kicking Horse	Gold, silver.
A-133	Wells Fargo	Do.
A-134	Elliptic Mining Co.	
A-135	Undeveloped prospect	
A-136	Undeveloped prospect	
A-137	Undeveloped prospect	
A-138	Bismark (Globe)	Gold, silver.
A-139	Columbus	Do.
A-140	Deadwood-Terra	Do.
A-141	Durango mine	Gold, silver, tungsten.
A-141	Harrison Mine	Tungsten, gold.
A-141	Hidden Fortune Gold Mining Co.	Tungsten, gold, silver.

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Serial No.	Name	Commodity
A-142	Esmeralda	Gold, silver.
A-143	Gentle Annie	Do.
A-143	Monitor mine	Do.
A-144	Gladiator (cutting)	Do.
A-145	Glover	Do.
A-146	Hawkeye-Pluma	Do.
A-147	Hidden Treasure group	Do.
A-148	Jupiter	Do.
A-149	Minerva	Do.
A-150	Omega mine	Do.
A-150	Pinny	Do.
A-151	Oro Hondo	Do.
A-152	Pennsylvania	Do.
A-153	Homestake Mining Co	Gold, silver, tungsten.
A-154	Frerichs Mining Co	Gold, silver.
A-155	Slavonian	Pyrite.
A-156	Queen of the Hills	Gold, silver.

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American Mining Co	A-70
Anaconda	A-123
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Apex	A-46
Bald Mountain Mining Co	A-50
Balmoral group	A-71
Baltimore mine	A-47
Belle Eldridge Gold Mines	A-10
Ben Hur mine	A-48
Bion mine	A-69
Big Bonanza	A-81
Bismark (Globe)	A-138
Boscobel and Double Standard	A-82
Burlington and Golden Sands	A-50
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Gold (Con.)

Name	Serial No.
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Name	Serial No.
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Descriptions of Mineral Properties

A-1, Adelphi, (M.S. 489), Gold, Silver, Lead, Carbonate District, Lawrence County

The Adelphi was one of the larger silver producers of the Carbonate district before 1890. It is located in the NW1/4 sec. 15, T. 5 N., R. 2 E. and is owned by the Carbonate Consolidated Mining Co.

The ore occurred along the main mineralized fracture in the Carbonate district. This vertical trends N. 85° W., and may be traced for at least 2,700 feet on the surface. The Pahasapa limestone has been replaced locally by ferruginous jasperoid and manganese oxides, associated with which are galena and secondary lead minerals containing silver. The crevice itself was filled with dark-red gouge carrying high gold values. Mineralization appears to be associated with adjacent intrusions of Tertiary porphyry. A vertical contact between limestone and porphyry is exposed in the caved collar of the Adelphi shaft.

One deep shaft and several shallow shafts and prospect pits are aligned across the property and extend onto the adjacent Brooklyn (M S. 874) claim to the west. All are now caved. Surface elevation at the shaft is 5,510 feet.

No production data are available.

Ref.: 1, p. 53; 17, p. 29; 33, p. 177-178.

A-2, Cleopatra, Gold, Silver, Carbonate District, Lawrence County

About 1900, a group of claims totaling 180 acres was assembled by the Cleopatra Gold Mining Co. These were located on the north side of Squaw Creek near the center of sec. 16, T. 5 N., R. 2 E. The property is now owned by Clarence Hughes, Rapid City, and associates.

Ore occurs as a replacement in the upper part of the Deadwood formation and possibly in the overlying Englewood shale. The company did over 1,000 feet of lateral drifting and sank a shaft, presumably to the basal quartzite.

A 50-ton cyanide mill was built on the property in 1900-1901. It operated for 15 months and then shut down, presumably because of the low tenor of ore remaining to be treated. Development continued intermittently until at least 1907.

Total production is reported to have been in the neighborhood of $200,000.

Ref.: 2, p. 172; 33, pp. 152, 212; 44, pp. 33, 36, 44 and pl. 17.

A-3, Black Hills Clay Products Co., Clay and Brick, Unorganized District, Butte County

The clay pit of the Black Hills Clay Products is about 3 miles south of Belle Fourche in sec. 26, T. 8 N., R. 2 E. The plant is at Belle Fourche.

The deposit of clay is 20 to 30 feet thick and is overlain in places by 25 to 30 feet of soft sandstone. Most of the clay is medium-hard clay that breaks into convenient sizes. The predominant color is gray, but part of the clay is mottled purple. Both clays produce red brick and tile of good color and excellent grade.

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Output from the plant is equivalent to 3,700 bricks an hour. Hollow tile and drain tile also are produced and shipped throughout the Black Hills and adjacent areas.

Ref.: 12, pp. 305-309.

A-4, Iron Hill, Gold, Silver, Lead, Carbonate District, Lawrence County

The Iron Hill mine, largest of the lead-silver-gold producers in the Carbonate district, is located in the NW1/4 sec. 15, T. 5 N., R. 2 E. It was acquired by the Carbonate Consolidated Mining Co. in 1937.

Irving describes the ore bodies as of two types, argentiferous lead minerals associated with porphyry intrusions into the Pahasapa limestone and soft ferruginous gouge carrying gold and silver values, which fills the main fissure upon which the shaft was sunk. One pocket of 4 to 5 tons of vanadinite has been reported.

The main shaft, 460 feet deep, is located near the center of the Utica claim. Old maps show about 6,000 feet of lateral workings on 5 levels, the deepest of which is at 300 feet. An exploration drift on the 300-foot level extends to the bottom of the New Titanic shaft 450 feet to the west. A drainage tunnel 1,300 feet long extends S. 10° W. from the 300-foot level and comes out in a gulch tributary to Squaw Creek. Near the south end of the claim are the shallow Home Run and Buntz shafts. The Home Run is accessible; the main Iron Hill workings may be entered by removing some recent caving at the portal of the drainage tunnel.

Production of the Iron Hill mine is reported for 1885-88 and 1891 as $667,218, apparently representing total values in silver, lead, and gold. Between 1901 and 1911 the Iron Hill dumps were reworked, with a total recovery of 82.91 oz. gold, 18,511 oz. silver, and 183,191 pounds of lead.

Ref.: 1, pp. 53-56; 2, pp. 45, 151; 17, p. 29; 33, pp. 177-178; 61, 1891, p. 59.

A-5, Carbonate Consolidated Mines, Inc., Gold, Silver, Lead, Carbonate District, Lawrence County

The Carbonate Consolidated Mines, Inc., was formed in 1937 to take over the most productive of the old silver-lead mines in the Carbonate district. About 400 acres were assembled, including a large block in sec. 15, T. 5 N., R. 2 E. upon which such old mines as the Seabury-Calkins, Iron Hill, Segregated Iron Hill, Adelphi, and Spanish R were located. A much smaller block consists of five claims in Rubicon Gulch, in sec. 10, T. 5 N., and includes the old mill and smelter sites.

In 1939, while under lease to the Richmond Hill Mining Co., a small camp was built, the Seabury-Calkins and Home Run shafts were partly retimbered, and considerable sampling was done in the Seabury-Calkins and Iron Hill workings. No development was undertaken, and the lease has now lapsed.

Ref.: 1, pp. 53-56.

A-5, Seabury-Calkins, Gold, Silver, Lead, Carbonate District, Lawrence County

The Seabury-Calkins mine is located at Carbonate camp, near the center of N1/2 sec. 15, T. 5 N., R. 2 E. It is owned by the Carbonate Consolidated Mining Co.

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Mineralization lies along a vertical fracture cutting the Pahasapa limestone. The fracture strikes N. 85° W. and may be traced at the surface for at least 2,700 feet. Walls of this crevice have been replaced to a depth of 2 to 5 feet with ferruginous jasperoid and with manganese oxides. The fissure which varies from 2 to 20 feet in width, is filled with soft, reddish gouge carrying high values in gold and silver. Some of the mineralization is definitely associated with the intrusion of porphyry dikes and sills.

The Seabury-Calkins shaft is reported to be 240 feet deep, but it is water filled to within 100 feet of the surface. It was retimbered to the latter depth in 1939 while under lease to the Richmond Hill Mining Co. A stope along the main fracture at the 65 foot level extends eastward 260 feet, where it comes to the surface at the "snow hole", and it may be followed westward for 170 feet, where a porphyry dike is encountered.

No complete production figures are available for the Seabury mine. Ore-dump cleaning netted $2,000 at the D & D smelter in 1891. It is possible that some of the production credited to the Iron Hill mine actually came from the smaller adjacent properties.

Ref.: 1, pp. 53-56; 2, p. 173; 33, pp. 177-178; 61, 1891, p. 59.

A-6, Segregated Iron Hill, Gold, Silver, Lead, Carbonate District, Lawrence County

The Segregated Iron Hill mine lies near the center, N1/2 sec. 15, T. 5 N., R. 2 E. It is located on the Ultimo claim near the eastern edge of the Carbonate camp area. It is now part of the property controlled by the Carbonate Consolidated Mining Co.

The mine is on the eastward extension of the mineralized vertical upon which the Adelphi, Iron Hill, and Seabury-Calkins mines are located. The surface rock is Pahasapa limestone, but a nearly horizontal limestone-porphyry contact is exposed in the 30-foot pit where the main shaft has caved. Mineralization apparently occurred in a porphyry sill along the main fracture.

Little is known of the workings of the mine. A very shallow drift connected it to the snow hole on the claim to the west. The main shaft is caved, as noted above; judging from the dump it may have been in the neighborhood of 150 to 200 feet deep.

No separate production figures are available.

Ref.: 17, p. 29; 33, pp. 177-178.

A-7, Spanish R, Gold, Silver, Carbonate District, Lawrence County

The Spanish R mine is an old gold-silver producer located at the west edge of the Carbonate District in the SW1/4NW1/4 sec. 15, T. 5 N., R. 2 E. It is controlled by the Carbonate Consolidated Mining Co., who acquired it in 1937.

Mineralization occurs near the contact between Pahasapa limestone and irregular intrusions of Tertiary porphyry. According to old reports, the ore was a thoroughly oxidized red gouge along vertical fractures. Contrary to published reports, the mine does not lie upon a westward extension of the main east-west vertical upon which the Iron Hill, Seabury-Calkins, and other mines are located.

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Workings consisting of a shaft, reported to have been 425 feet deep, short drifts, and numerous trenches and test pits, are all inaccessible. They are located on the Richmond claim (M.S. 680) but may extend under the adjacent Spanish claim (M.S. 679). Elevation at the collar of the shaft is 5,330 feet.

The Spanish R is reported to have produced $50,000 in gold before 1904. There has been no activity since that date.

Ref.: 1, p. 55; 2, p. 151; 17, p. 29; 33, pp. 177-178.

A-8, Alexander, (M.S. 1262), Silver, Lead, Galena District, Lawrence County

The Alexander (George Alexander) mining claim is located near the top of Custer Hill south of the town of Galena and just north of the center of sec. 9, T. 4 N., R. 4 E. It was operated as the Alexander Mining Co. in the late 1880's.

The ore is developed in the upper ore-bearing horizon of the Deadwood formation. On this property the ore lies close to the upland surface, and consequently it has been thoroughly oxidized. The ore horizon has been developed by numerous test pits, trenches, and shallow drifts, all of which are now slumped or caved.

Irving lists the Alexander as being the 8th most important silver producer in the district before 1904, but no statistics are available. It is doubtful if there has been any mining done on the property since 1891.

Ref.: 17, p. 29; 33, p. 170.

A-9, Alice, (M.S. 1749), Silver, Lead, Galena District, Lawrence County

Th The Alice lead-silver mine is located north of the Groshong near the south edge of the Galena mining district. It lies in the center of the S1/2 sec. 9, T.4 N., R. 4 E. on the east side of an unnamed tributary of the Bear Butte Creek.

The workings consist of a main drift, extending northeast into the hillside from the outcrop for 375 feet, and a cross drift, extending southeast from a point 180 feet from the portal of the main drift. The workings were fully accessible for examination in the fall of 1949.

The ore zones lie along a series of vertical fractures cutting the lower ore horizon of the Deadwood formation, which here is separated from the pre-Cambrian contact by about 20 feet of dense gray quartzite. The entire sedimentary section dips to the northeast at from 5° to 10°.

No separate production figures are available, but the Alice is reported to have been one of the better small producing mines in the 1880's.

Ref.: 12, p. 99.

A-10, Belle Eldridge Gold Mines, (Deadwood Zinc and Lead Co.), Gold, Silver, Lead, Zinc, Deadwood, Lawrence County

The properties of Belle Eldridge Gold Mines, Inc., lie in Spruce Gulch, 1 mile east of Deadwood, and center in the NW1/4 sec. 25, T. 5 N., R. 3 E. The holdings

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consist of 12 patented and 19 unpatented claims totaling 177 acres, including much of the holdings of the old Lexington Hill Co.

Early operations in the area were confined to gold mining, primarily on the Belle Eldridge claim. Extensive drifting was done in the Deadwood formation, but most of the old workings are now caved.

Lead and zinc were noted in the late 1890's, but the first commercial mining was during World War I by the Deadwood Zinc and Lead Co. on what is now the Helen Gould claim. Present owners took over in 1941, built a small flotation mill, and have produced lead-zinc concentrates on a small scale since 1942.

The lead-zinc ore, consisting of pyrite, galena, sphalerite (marmatite), and arsenopyrite, is a replacement in dolomite and dolomitic shale of the Deadwood formation. It lies between the top of a porphyry sill and a dense shale layer, which lies 7 to 15 feet above the porphyry. The ore body varies from 6 inches to 18 feet in thickness, with an average thickness where mined of 5 feet.

In the interval 1942-48 Belle Eldridge Mines have shipped 10 cars of concentrates carrying lead, zinc, gold, and silver.

Ref.: 1, p. 49; 11, pp. 109-110; 36, pp. 94-95; 55, pp. 810-825.

A-11, Branch Mint, Silver, Lead, Galena District, Lawrence County

The original Branch Mint mine is located in the NW1/4 sec. 3, T. 4 N., R 4 E. However, the Branch Mint Mining Co. was at one time one of the largest holders of mining claims in the Galena area, with over 200 claims, a 180-stamp cyanide mill, and 3 miles of private railroad.

The mine on the Branch Mint claim consists of several hundred feet of drifts extending northeast into the hillside above the lower end of the old Mogul Mill. Elevation of the portal is approximately 4,650 feet. A second tunnel lies 150 feet east of the main adit. Workings were easily accessible in the fall of 1949.

The ore, which lies along verticals that cut the upper ore horizon of the Deadwood formation, is thoroughly oxidized to an earthy brown material in which no distinct minerals may be identified. Old reports indicate an abundance of native silver and horn silver in the richer ore pockets. The quartzite beneath the ore is heavily impregnated with manganese and iron oxides.

No production records are available, but the mine is reported to have been one of the richer small silver producers in the early 1800's.

Ref.: 2, p. 172; 11, pp. 102-107; 36, p. 96.

A-12, Bullion, Silver, Lead, Galena District, Lawrence County

The Bullion claim was a small prospect and producer of lead-silver ore in the Galena district in the early days of that camp. It is located on the upland surface south of Bear Butte Creek, in the NE1/4 sec. 9, T. 4 N., R. 4 E.

Ore was developed along the upper contact zone in the Deadwood formation. Mineralization followed several nearly vertical fractures and spread laterally

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by replacement of the dolomite. At the largest adit on the property ore was developed between two verticals spaced about 3 feet apart, each striking S. 75° E. and dipping 85° to the south.

Little is known about the history of the prospect. Production was probably quite small, although 8 men were reported working on the property in 1893. Geological reports on the district fail to mention the Bullion.

Ref.: 61, 1892, 1893.

A-13, Clover Leaf (Uncle Sam, Anaconda), Gold,
Galena District, Lawrence County

The Clover Leaf Gold mine is located in Roubaix on Elk Creek in the SW1/4 sec. 29, T. 4 N., R. 4 E. The Clover Leaf group consists of 1,200-1,600 acres of patented ground in the same vicinity. The property has changed hands numerous times since its discovery in 1878. The latest operation was in 1934-37, when it was under lease to the Anaconda Gold Mining and Milling Co.

The ore body consists of a saddle-shaped mass of milky quartz on a pitching anticlinal fold within pre-Cambrian mica schist. The fold trends N. 64° W., and pitches 30° to the southeast. The ore body averages about 20 feet thick on the northwest flank and 12 feet thick on the southwest limb of the fold. Minerals consist of coarse free gold with associated galena, sphalerite, pyrite, and chalcopyrite.

Development includes a 700-foot vertical 3-compartment shaft, and extensive drifting on each of 7 levels, the lowest of which is at 650 feet. Quartz ore shoots have been mined continuously from the surface to the 650-foot level. Individual stopes are reported to be as much as 150 feet long and 30 feet wide.

Gold production is estimated by Allsman to total $900,000, all but about $10,000 of which was recovered before 1905.

Ref.: 1, pp. 14-19; 2, pp. 140-141; 12, pp. 111-114; 33, p. 92, pl. VIII; 36, pp. 91-92; 61, 1899.

A-14, Coletta (M.S. 1137), Silver, Lead,
Galena District, Lawrence County

The Coletta lies in the NW1/4 sec. 16, T. 4 N., R. 4 E. high on a divide between Bear Butte Creek and the Tributary from the south upon which the Silver Queen is located. It was originally one of the Branch Mint properties.

Despite the fact that the Coletta is mentioned by all writers dealing with the Galena district, nothing has been written of its geology or history. The ore horizon lies above the basal quartzite of the Deadwood formation but is near the surface on the divide. It was developed by drifting where cover was adequate, otherwise by trenching. Judging from old trenches and alignment of sink holes and old shafts, the ore followed three sets of vertical fractures, running N. 45° E., N. 63° E., and S. 30° E., respectively. The ore appears to have been thoroughly oxidized, as in the nearby Silver Queen mine.

Irving lists the Coletta as the fourth most important silver mine in the Galena district before 1904.

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Ref.: 11, p. 99; 12, p. 190; 17, p. 29; 33, pp. 170-171.

A-15, Cora, (M.S. 367-A), Silver, Lead,
Galena District, Lawrence County

The Cora mine lies in the center of the N1/2 sec. 9, T. 4 N., R. 4 E., about 170 feet above Bear Butte Creek in the Galena mining district.

The mine is developed in the lower contact ore horizon of the Deadwood formation. Although the regional dip is northeast, locally at the Cora dips up to 24° southeast have been recorded. The mineralization has been controlled by a series of northeast-trending vertical fractures. Where these verticals cut the first dolomite, about 20 feet above the base of the Deadwood formation, limited replacement has taken place.

The ore, like that of the Horseshoe-Comet to the north, is high in pyrite and is much less oxidized than in the Silver Queen and other lower contact mines 1/2 mile to the south.

The workings are small and consist of several drifts extending southeast into the hillside in a short draw on the south side of Bear Butte Creek opposite the west end of the town of Galena. Portals of all but the most westerly drifts were caved in 1949. Irving lists the Cora as the sixth most important silver producer in the Galena district before 1904.

Ref.: 11, p. 99; 12, p. 190; 17, p. 29; 33, pp. 170-171; 61, 1891, 1892.

A-16 Custer, (M.S. 919), Silver, Lead,
Galena District, Lawrence County

The Custer mine is located high on the south slope of Bear Butte Creek in the SE1/4 sec. 4, T. 4 N., R. 4 E. The main portal lies about 440 feet above the town of Galena, at an elevation of 4,978 feet. The property is one of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

The ore lies in the upper contact zone of the Deadwood formation, which here slopes to the northeast at 10°. Apparently, only a few inches of soft oxidized ore overlay the quartzite in this area. The quartzite itself is highly impregnated with oxides of manganese and iron.

Workings, which include little more than development work, extend into the hillside for about 100 feet. They were accessible in October 1949. Some of the workings of the Merritt No. 2 mine extend under the Custer claim. This lower contact ore was mined under apex rights in the 1880's. The two mineralized levels are separated by 200 feet of barren Deadwood formation.

No production figures for the Custer mine are available, but, from the width to which some of the drifts were stoped out, some commercial silver ore must have been produced in the early days of the Galena camp.

A-17, Double Rainbow, Silver, Lead,
Galena District, Lawrence County

The Double Rainbow (formerly the Richmond-Sitting Bull), is located in secs. 3 and 4, T. 4 N., R. 4 E. Workings, extending 1,300 feet north-south and 650 feet

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east-west, underlie parts of the Richmond-Sitting Bull, Tiger Tail, Silver Terra, Grand View, and Gulch claims. The present Double Rainbow group, consisting of 28 claims totaling about 290 acres, is owned by Double Rainbow Mines, Inc., of which DeWolfe Barton, Pierre, S. Dak., is president.

The property was discovered in 1876 and is reported to have produced about $410,000 in silver in 26 months during 1881-83. In the latter year apex litigation began and continued in the courts for 16 years. Small-scale operation was resumed in 1889-91, producing an additional $41,000.

The Richmond-Sitting Bull Mining Co. was formed in 1905 when 15 claims were assembled by E. C. Barton, grandfather of the present owner. Some equipment was installed and development continued until 1912. In 1930-31, DeWolfe Barton rehabilitated the mine and built a 150-ton flotation mill. This operated for about 6 weeks on material from the old dumps, but extraction was not satisfactory. The mill was dismantled in 1945.

Mineralization occurs in the upper ore-bearing zone of the Deadwood formation. Distribution is controlled by two sets of vertical fractures. The richest ore originally mined consisted of vugs of argentiferous galena. The ore remaining in sight is badly oxidized, but much disseminated pyrite and galena may be found throughout the mine. Most of the workings were readily accessible in 1949 through tunnel 5.

Ref.: 11, pp. 102-108, pl. 18-A; 17, p. 29; 36, pp. 100, 114; 59, pp. 23-24.

A-18, El Refugio, (M.S. 88), Silver, Lead,
Galena District, Lawrence County

The claim is located in the S1/2NE1/4 sec. 4, T. 4 N., R. 4 E. in the Galena mining district. The El Refugio workings lie on a flat topped ridge between Butcher Gulch and a small tributary, which enters Bear Butte Creek behind the old Mogul Mill.

The ore is the typical, thoroughly oxidized carbonate ore of the upper ore horizon of the Deadwood formation. It rests on a dense quartzite, which is heavily impregnated with iron and manganese oxides, and is in turn overlain by a section of slabby dolomite. On this claim the ore horizon lies only a few feet below the upland surface at an elevation varying from 4,870 to 4,900 feet. The principal workings lie along a vertical fracture which trends N. 80° E. The deposit has been developed by a series of trenches, pits, and drifts along a distance of 260 feet. Numerous other pits, trenches, and short drifts occur on the property. About half of the workings were accessible in the fall of 1949.

The El Refugio was a small producer of silver ore in the early days of the camp. No production figures have been preserved. Irving lists it as one of the less important mines before 1904, and there is no record of any work on the property since that date.

Ref.: 17, p. 29; 33, pp. 170-171.

A-19, Florence, (M.S. 163), Silver, Lead,
Galena District, Lawrence County

The Florence mine, which lies on the north side of Bear Butte Creek and across the gulch from Richmond-Sitting Bull claims, was discovered in 1876. It is located

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in the NW1/4 sec. 3, T. 4 N., R. 4 E. in the Galena mining district. The Florence is now part of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

Workings consist of a main drift slightly over 700 feet long, extending N. 50° E. into the Hillside about 190 feet above the level of Bear Butte Creek and directly above the old Mogul Mill. Small stopes, short lateral drifts, and 100-foot winze complete the workings. All drifts were accessible in 1949.

Mineralization occurs where northeast-trending verticals have cut the upper ore horizon of the Deadwood formation. The ore is thoroughly oxidized to a soft brown to yellow material. No minerals can now be identified with the naked eye, but early reports indicate the presence of native silver and horn silver in some abundance. The properties north of Bear Butte Creek are also reported to have carried higher gold values than those to the south.

No production data are available, though the Florence is reported by Irving to have been next to the Richmond-Sitting Bull in importance as a silver producer in the Galena area before 1904.

Ref.: 11, pp. 102-108; 17, p. 29; 33, pp. 170-171.

A-20, Gold Mountain Mining Co., Gold, Silver,
Two Bit District, Lawrence County

The Black Diamond-Gold Mountain group of claims is located on Two Bit Creek in secs. 29 and 30, T. 5 N., R. 4 E. It consists of 21 patented claims totaling 211 acres. In 1937 it was owned by the Gold Mountain Mining and Milling Co.

Ore is developed in the upper contact ore horizon of the Deadwood formation along a series of north-south fractures, which are believed to be a continuation of those encountered in the Deadwood-Heidelberg (Mascot) group to the north.

According to Lincoln, the property is developed by a 185-foot shaft plus a series of drifts and open cuts. Most of the work was done in the early 1890's. Production for 1892-94 is given as 75.5 tons of ore, with a return value of $1,725.50 at the old price of gold. Except for limited development work, the property has been idle since that time.

Ref.: 1, p. 50; 36, p. 102.

A-21, Golden Crest, (M S. 1239), Gold, Silver,
Galena District, Lawrence County

The Golden Crest mine is located on the divide between Two Bit Creek and Strawberry Gulch in the SW1/4 sec. 6, T. 4 N., R. 4 E., 2 miles northwest of Galena. It is currently held by Commonwealth Gold, Inc.; before 1941 it was owned by Deadwood Gold, Inc.

The ore body is developed along a nearly vertical shear zone, 8 to 40 or 50 feet wide, trending southeast. The northeast side is uplifted, apparently as a result of igneous intrusion. The main shaft, sunk in the shear zone, penetrated porphyry for about 200 feet, encountered a small section of basal Deadwood, and then entered pre-Cambrian schists, for a total depth of 330 feet. Extensive drifting and stoping has been done in the shear zone on the 80-, 125-, and 180-foot levels. Irregular drifting has been done at the Deadwood contacts, and exploratory drifting at the 300-foot level takes an irregular course. Over 4,500 feet of drifting has been done.

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The property is currently being examined. Most of the workings below the caved upper level are accessible. A 300-ton cyanide mill is standing on the property.

Allsman gives the early day bullion production as about $100,000 in gold. There has been no production since 1906.

Ref.: 1, pp. 63-64; 36, pp. 98-99.

A-22, Gilt Edge Mine, Gold, Silver,
Galena District, Lawrence County

The Gilt Edge mine lies on the Gilt Edge and Dakota Maid claims in the southwest corner of sec. 5 and southeast corner of sec. 6, T. 4 N., R. 4 E. near the head of Strawberry Gulch.

The mine is one of several now included in the Gilt Edge group owned by Mrs. Leslie Sansom of New York City.

The ore lies in a brecciated porphyry originally cemented with auriferous pyrite but now altered to limonite near the surface. Small amounts of copper sulfides have given trouble in cyaniding the ores.

Workings consist of a network of drifts and stopes about 400 by 700 feet carried out to the surface by the 1,450-foot King tunnel. Some drifting has been done at a 95-foot level above the main adit, and one 42-foot winze extends below that level. Stoping has continued upward, and includes a large open cut at the surface. Individual ore shoots are irregular, and some reached 50 by 150 feet in stoping areas.

This property operated almost continuously from 1900-1902, and from 1905-16. Production for that interval is given as 37,486.16 ounces of gold and 20,536 ounces of silver. A small part of the production of the Gilt Edge mine since 1937 is from the Gilt Edge Maid, but the major part of the ore has been taken from the adjacent Rattlesnake Jack. The property has been inactive since 1941, but is maintained in standby condition.

Ref.: 1, pp. 56-62; 11, p. 112; 36, pp. 101-102; 61, 1898, p. 51.

A-23, Groshong, (M S. 1584), Silver, Lead,
Galena District, Lawrence County

The Groshong mine, on the claim of the same name, is located north of the Silver Queen near the south end of the Galena mining district in the center of sec. 9, T. 4 N., R. 4 E. In 1947 the Groshong was part of the Silver Queen group, owned by H. H. Stewart and Nels Thompson of Deadwood, S. Dak.

In the northern Black Hills area ores are frequently found as replacement bodies in the first dolomite bed above the basal quartzite of the Deadwood formation. This horizon, which locally occurs about 20 feet above the pre-Cambrian contact, is referred to as the lower contact.

Regional dip of the Deadwood on this property is about 10° to the northeast, but locally, within the mine, dips range from 5° to 11° in directions ranging from N. 15° W. to N. 80° E. The Groshong is typical of the mines on the lower contact

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in the NW1/4 sec. 3, T. 4 N., R. 4 E. in the Galena mining district. The Florence is now part of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

Workings consist of a main drift slightly over 700 feet long, extending N. 50° E. into the Hillside about 190 feet above the level of Bear Butte Creek and directly above the old Mogul Mill. Small stopes, short lateral drifts, and 100-foot winze complete the workings. All drifts were accessible in 1949.

Mineralization occurs where northeast-trending verticals have cut the upper ore horizon of the Deadwood formation. The ore is thoroughly oxidized to a soft brown to yellow material. No minerals can now be identified with the naked eye, but early reports indicate the presence of native silver and horn silver in some abundance. The properties north of Bear Butte Creek are also reported to have carried higher gold values than those to the south.

No production data are available, though the Florence is reported by Irving to have been next to the Richmond-Sitting Bull in importance as a silver producer in the Galena area before 1904.

Ref.: 11, pp. 102-108; 17, p. 29; 33, pp. 170-171.

A-20, Gold Mountain Mining Co., Gold, Silver,
Two Bit District, Lawrence County

The Black Diamond-Gold Mountain group of claims is located on Two Bit Creek in secs. 29 and 30, T. 5 N., R. 4 E. It consists of 21 patented claims totaling 211 acres. In 1937 it was owned by the Gold Mountain Mining and Milling Co.

Ore is developed in the upper contact ore horizon of the Deadwood formation along a series of north-south fractures, which are believed to be a continuation of those encountered in the Deadwood-Heidelberg (Mascot) group to the north.

According to Lincoln, the property is developed by a 185-foot shaft plus a series of drifts and open cuts. Most of the work was done in the early 1890's. Production for 1892-94 is given as 75.5 tons of ore, with a return value of $1,725.50 at the old price of gold. Except for limited development work, the property has been idle since that time.

Ref.: 1, p. 50; 36, p. 102.

A-21, Golden Crest, (M S. 1239), Gold, Silver,
Galena District, Lawrence County

The Golden Crest mine is located on the divide between Two Bit Creek and Strawberry Gulch in the SW1/4 sec. 6, T. 4 N., R. 4 E., 2 miles northwest of Galena. It is currently held by Commonwealth Gold, Inc.; before 1941 it was owned by Deadwood Gold, Inc.

The ore body is developed along a nearly vertical shear zone, 8 to 40 or 50 feet wide, trending southeast. The northeast side is uplifted, apparently as a result of igneous intrusion. The main shaft, sunk in the shear zone, penetrated porphyry for about 200 feet, encountered a small section of basal Deadwood, and then entered pre-Cambrian schists, for a total depth of 330 feet. Extensive drifting and stoping has been done in the shear zone on the 80-, 125-, and 180-foot levels. Irregular drifting has been done at the Deadwood contacts, and exploratory drifting at the 300-foot level takes an irregular course. Over 4,500 feet of drifting has been done.

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The property is currently being examined. Most of the workings below the caved upper level are accessible. A 300-ton cyanide mill is standing on the property.

Allsman gives the early day bullion production as about $100,000 in gold. There has been no production since 1906.

Ref.: 1, pp. 63-64; 36, pp. 98-99.

A-22, Gilt Edge Mine, Gold, Silver,
Galena District, Lawrence County

The Gilt Edge mine lies on the Gilt Edge and Dakota Maid claims in the southwest corner of sec. 5 and southeast corner of sec. 6, T. 4 N., R. 4 E. near the head of Strawberry Gulch.

The mine is one of several now included in the Gilt Edge group owned by Mrs. Leslie Sansom of New York City.

The ore lies in a brecciated porphyry originally cemented with auriferous pyrite but now altered to limonite near the surface. Small amounts of copper sulfides have given trouble in cyaniding the ores.

Workings consist of a network of drifts and stopes about 400 by 700 feet carried out to the surface by the 1,450-foot King tunnel. Some drifting has been done at a 95-foot level above the main adit, and one 42-foot winze extends below that level. Stoping has continued upward, and includes a large open cut at the surface. Individual ore shoots are irregular, and some reached 50 by 150 feet in stoping areas.

This property operated almost continuously from 1900-1902, and from 1905-16. Production for that interval is given as 37,486.16 ounces of gold and 20,536 ounces of silver. A small part of the production of the Gilt Edge mine since 1937 is from the Gilt Edge Maid, but the major part of the ore has been taken from the adjacent Rattlesnake Jack. The property has been inactive since 1941, but is maintained in standby condition.

Ref.: 1, pp. 56-62; 11, p. 112; 36, pp. 101-102; 61, 1898, p. 51.

A-23, Groshong, (M S. 1584), Silver, Lead,
Galena District, Lawrence County

The Groshong mine, on the claim of the same name, is located north of the Silver Queen near the south end of the Galena mining district in the center of sec. 9, T. 4 N., R. 4 E. In 1947 the Groshong was part of the Silver Queen group, owned by H. H. Stewart and Nels Thompson of Deadwood, S. Dak.

In the northern Black Hills area ores are frequently found as replacement bodies in the first dolomite bed above the basal quartzite of the Deadwood formation. This horizon, which locally occurs about 20 feet above the pre-Cambrian contact, is referred to as the lower contact.

Regional dip of the Deadwood on this property is about 10° to the northeast, but locally, within the mine, dips range from 5° to 11° in directions ranging from N. 15° W. to N. 80° E. The Groshong is typical of the mines on the lower contact

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in this area. The ore is highly oxidized to a soft, yellow-brown material in which no distinct minerals may be seen. For a detailed description of the ore, reference is made to the description of the Silver Queen.

Workings consist of two closely spaced portals leading into a single adit, which extends northeast along a vertical mineralized fracture for approximately 310 feet. They were readily accessible in October 1949.

No production figures are available, but the mine was a small producer of silver during the boom years of the district.

Ref.: 11, p. 99.

A-24, Hardin Properties, Gold, Pyrite, Iron Ore,
Two Bit District, Lawrence County

The Hardin group of mineral claims was assembled by Judge James Hardin of Deadwood before the turn of the century. It lies around the old camp of Two Bit on Two Bit Creek and is centered in the NE1/4 sec. 36, T. 5 N., R. 3 E. Originally exploited for gold from the Deadwood formation, the discovery of gold-bearing pyrite in the 200-foot Hardin shaft on the Moulton claim led to the sinking of several shafts in that vicinity in 1897-98. Gold values proved to be low, and the market for pyrite was very limited, so that an expected boom in that district failed to materialize. In 1899, the Hardin Mining and Manufacturing Co. was shipping about 30 tons of pyrite a day to the Golden Reward Smelter at Deadwood.

Oxidized pyritic ore, such as that on the Helen and Noble Grand claims, was exploited first for gold, then for iron ore, and also as hematite for paint pigment. Interest in the property in recent years has been confined to the production of pigment.

Ref.: 33, pp. 162-163; 61, 1897-98.

A-25, Hayes, (M.S. 493), Silver, Lead,
Galena District, Lawrence County

The Hayes (or Rutherford B Hayes) mine lies in the NE1/4SW1/4 sec. 9, T. 4 N., R. 4 E. high on the hillside east of a tributary of Bear Butte Creek in the Galena mining district. The elevation of the main adit is about 4,880 feet. The property was under option to H. H. Stewart and Nels Thompson of Deadwood in 1942.

The ore, which is similar to that described for the Silver Queen mine, lies in the lower contact zone of the Deadwood formation. It follows a series of northeast-trending vertical fractures and was deposited by replacement in a sandy dolomite bed about 20 feet above the pre-Cambrian contact. The Deadwood has a regional dip in this area of about 10° to the northeast. In the northeast part of the Hayes mine, however, dips up to 30° accompany local minor faulting, with displacements ranging from a few inches to as much as 9 feet.

Workings are extensive under an area about 450 feet east-west and 360 feet north-south. Although the adits are all on the Hayes claim, the drifts extend eastward and underlie the Crow claim (M.S. 1867). In spite of some caving at the portals, all workings were accessible in October 1949.

The mine was a modest producer of silver ore in the early days of the camp, but no production figures have been preserved.

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Ref.: 11, p. 99; 61, 1893.

A-26, Hester A, (M.S. 1446), Silver, Lead,
Galena District, Lawrence County

The Hester A mine lies high on a hillside above a tributary of Bear Butte Creek in the Galena (Bear Butte) mining district. It is located in the NW1/4 sec. 9, T. 4 N., R. 4 E. The portal is about 240 feet above the creek, at an elevation of 4,887 feet.

Although the mine could be reached by round-about trails, supplies and ore were moved directly down the hillside on a steeply inclined haulageway. The slope is so steep that dump material has rolled clear down to the creek. Development of the mine consisted of several drifts following verticals that cut the lower ore-bearing horizon of the Deadwood formation, here separated from the pre-Cambrian contact by about 15 feet of dense quartzite. The Deadwood has a regional dip of about 10° to the northeast. Workings were accessible in 1949.

The mine was a small silver producer in the early days of the camp, though no figures are available. Irving lists it as third most important in the Galena district before 1904.

Ref.: 17, p. 29; 33, p. 170; 61, 1893.

A-27, Hoodoo-Union Hill Group, Gold, Silver,
Galena District, Lawrence County

The Hoodoo-Union Hill group consists of about 120 acres of patented mineral claims in the SW1/4 sec. 5, and southeast corner sec. 6, T. 4 N., R. 4 E. about 1-1/2 miles northwest of Galena. The property was once part of the extensive holdings of the Branch Mint Mining & Milling Co.

The deposit lies north of the Gilt Edge group in the same mass of quartz monzonite porphyry. Ore is found in brecciated zones cemented by pyrite, which is oxidized to limonite near the surface.

The group is developed by 3 shafts, considerable lateral workings, and 4 prospect tunnels. The Eureka shaft, near the western end of the property, is 200 feet deep. The Hoodoo has a total of 450 feet of lateral work on the 100- and 200-foot levels, and an 800-foot drift at the bottom, or 300-foot level, connects to the Union Hill shaft. The latter is 470 feet in total depth.

Early production of the Branch Mint Co. cannot be broken down to individual properties, though $150,000 in gold is reported from the Union Hill about 1900. The property has been idle since 1912.

Ref.: 1, pp. 56, 62-63; 2; 17, p. 29; 36, p. 107.

A-28, Horseshoe-Comet, (M.S. 484), Gold, Silver, Lead, Pyrite,
Galena District, Lawrence County

The Horseshoe-Comet mine is near the center of the north edge of the NE1/4 sec. 9, T. 4 N., R. 4 E. The uppermost workings lie about 150 feet above Bear Butte Creek and are on the north slope of Custer Hill overlooking the town of Galena.

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The ore occurs in the lower ore horizon of the Deadwood formation. It is less oxidized than in many of the other mines of the area. As a result of polished section studies, Connolly reports, "..... pyrite, galena, tetrahedrite and a very little sphalerite and chalcopyrite. Pyrite is the earliest formed mineral. In some polished sections it appears to have been brecciated, and the later ore minerals were then deposited around and among the crushed pyrite grains, partly replacing them."

Apparently due to displacement of the ore horizon by a series of intrusive sills, workings have been developed over a vertical range of nearly 100 feet. Only a few of the upper drifts were accessible in 1949. Caved portals and water made examination of the other workings impossible.

The mine operated both as a silver producer and as a source of smelter pyrite. The complete history of the mine is not available. It was operated in the 1880's, is recorded as shipping to the Deadwood smelter in the early 1900's, and was finally shut down in 1918.

Ref.: 11, pp. 99, 102, pl. 17; 12, p. 192, pl. 24-A; 17, p. 29; 33, 171.

A-29, Lexington Hill, Gold, Silver,
Deadwood, Lawrence County

The Lexington Hill Gold Mining Co. was formed in 1903 to operate properties formerly known as the Highland Chief, Anna, Black Hills and Denver, Oro Cache, Ophir, and other small mining companies in Spruce Gulch. Previous production had come from the Deadwood formation, primarily from the Belle Eldridge, Oro Cache, Anna, Champion, and Highland Mary lodes. The irregularly shaped group centered in the SW1/4 sec. 25 but extended into parts of secs. 26, 35, and 36, T. 5 N., R. 3 E.

The company operated a small mill in 1902-3, then drove a 1,600-foot tunnel through the porphyry of Lexington Hill to intersect old workings on the Champion lode to the east. They failed to encounter good ore either in verticals in the porphyry or at the contact of the porphyry with the Deadwood formation. The mill was operated on ore from the Belle Eldridge and Katy claims as late as 1906. The property was taken over by the short-lived Evans Consolidated Mining Co. about 1911.

The most productive of these holdings are now owned by the Belle Eldridge Gold Mines, Inc.

Ref.: 2, pp. 143-145; 61, 1902-4.

A-30, Mary Group, (M.S. 1248), (Brosnahan), Tungsten,
Two Bit District, Lawrence County

The Mary group of tungsten claims lies on Two Bit Creek near the center of sec. 1, T. 4 N., R. 3 E. It consists of the Mary, Union, Smith, Power No. 2, and Power patented claims, totaling 45.63 acres. This group, together with the adjacent S. R. Smith group, was taken over in 1941 or 1942 by Pioneer Tungsten Mines, Inc., and a 30-ton mill was built on the Mary claim.

Tungsten ore, mostly huebnerite, occurs in the Deadwood formation at the contact between the basal quartzite and the overlying dolomite. In the Mary tunnel a porphyry sill overlies the dolomite about 6 feet above the quartzite. Mineralization has occurred adjacent to a vertical striking about N. 30° W. Short drifts and shafts have exposed this vertical for about 110 feet.

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In 1916 Martin Brosnahan shipped 1,600 pounds of hand-sorted tungsten ore from this property and also sold 300 pounds of high-grade specimen material. The large shipment ran 28 percent tungstic oxide. John Brosnahan, his son, panned and shipped 100 pounds of concentrates from the property in 1940, which gave a return of 63.7 percent tungstic oxide.

Ref.: 12, p. 204; 14, p. 25; 36, p. 97; 52, pp. 80-82.

A-31, Mascot Mining Co. (Deadwood-Heidelberg), Gold, Two Bit District, Lawrence County

The Old Deadwood-Heidelberg group consists of 9 unpatented claims on Two Bit Creek, in the NW1/4 sec. 29, and the SW1/4 sec. 20, T. 5 N., R. 4 E. Original development was begun by Deadwood interests in 1911; the most recent operator is the Mascot Mining Co., organized in 1929.

The ore body is a replacement in the dolomite near the top of the Deadwood formation. Because of numerous sill-like intrusions of porphyry, this zone is locally about 375 feet above the basal quartzite. Development consists of a 420-foot adit extending northeast into the hillside and a 440-foot crosscut 122 feet from the portal. Near the intersection of the main drift and the crosscut an 86-foot shaft extends to the surface.

Recorded production includes 143-1/2 tons of $20.00 ore in 1914-15 and a very small shipment of $10.00 ore in 1917. The mine has been idle since 1917, except for some development work about 1927 and an examination in 1935.

Ref.: 1, p. 50; 36, p. 110; 61, 1912-17.

A-32, Merritt No. 1, (M S. 73), and Merritt No. 2, (M.S. 133), Gold, Silver, Lead, Galena District, Lawrence County

The Merritt claims lie along the southeast side of the valley of Bear Butte Creek and extend north-south essentially through the center of the SE1/4 sec. 4, T. 4 N., R. 4 E. They are currently part of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

The ore is developed by replacement where vertical fractures cut the lower ore horizon of the Deadwood formation. Most of these mineralized zones strike from north-south to north 80° east. Connolly reports much residual galena and pyrite in varying stages of oxidation in the remaining ore, together with badly oxidized lollingite. The original ore bodies were higher in sulfides than ore bodies farther south in the district.

Workings on the Merritt No. 1 consist of a series of short tunnels driven east into the hillside and extending north-south 350 feet along the outcrop. Production of $7,000 in silver is reported.

The more extensive workings on the Merritt No. 2 extend over a north-south distance of 360 feet but extend eastward at least 450 feet under the Rock Hill and Custer claims. The No. 2 mine was among the more important silver producers during the early 1880's, though no continuous production figures have been preserved. Irving lists it as the fifth most important producer in the district before 1904. All but one of the portals was badly caved, and the lower part of the mine workings flooded in 1949.

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Ref.: 11, pp. 102-106; pl. 18-B, 19-A; 12, p. 192; 33, pp. 170-171; 61, 1917.

A-33, Monarch, (M.S. 908), Gold, Silver,
Whitewood District, Lawrence County

The Monarch gold-mining property, variously operated by the Monarch Mining Co., the Golden Feather Gold Mining & Milling Co. (1922-23), and as the Black Hills Mining Corp., is located along the north edge of sec. 1, T. 4 N., R. 3 E., and extends into secs. 35 and 36 of the township to the north. It consists of 6 claims totaling 56 acres along Two Bit Gulch 3 miles southeast of Deadwood.

Ore is a replacement in dolomite above the basal quartzite of the Deadwood formation. The Deadwood, which has been intruded by numerous porphyry sills in the immediate area, dips gently to the east. The mine is entered through a 200-foot adit and a 125-foot single compartment shaft. Lincoln reports up to 3,000 feet of drifting and crosscutting.

Production from 1902-36 is given by Allsman as 7,940 tons of ore yielding 4,311.67 oz. gold and 2,715 oz. silver. The property has been idle since 1937.

Ref.: 1, pp. 48-49; 2, p. 173; 36, pp. 96, 111; 61, 1922, p. 5.

A-34, Montezuma and the Whizzers, (M.S. 1324), Gold, Pyrite,
Deadwood, Lawrence County

This pyrite property (originally called the Gilmore mine) lies at the west edge of Deadwood in sec. 27, T. 5 N., R. 3 E.

The ore occurs as a quartz-pyrite replacement in a black graphitic slate member of the pre-Cambrian Flag Rock formation. This particular unit, locally called the iron dike has been traced from west of Deadwood to near Kirk, an outcrop distance of between 3 and 4 miles. On this property the deposit strikes N. 10° E. and dips 60° to 80° E. The ore is pyrite with a very small quantity of chalcopyrite. Secondary minerals from the latter have caused considerable prospecting for copper in the vicinity. A grab sample from the property shows 0.05 percent copper.

Workings extend south from the portal on Deadwood creek for an estimated distance of 650 feet. Along much of this distance the vein has been stoped out to a width of 10 feet or more, and irregular raises extend to considerable distance above the haulage level.

The mine was a major producer of pyrite for the Deadwood smelter from about 1900 to the time of the first world war. In 1902, 27,600 tons of pyrite, averaging $2.00 in gold, was mined and consumed. Complete production figures are not available.

Ref.: 2, pp. 156-157; 17, p. 28; 36, p. 112.

A-35, Oro Fino, Gold, Galena District,
Lawrence County

The Oro Fino mine lies in Strawberry Gulch, in the SW1/4NW1/4 sec. 8, T. 4 N., R. 4 E., slightly over 1 mile west of the mining town of Galena. It is now part of the Gilt Edge Mines, Inc., property owned by Mrs. Leslie Sansom of New York City.

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The ore in the Oro Fino lies in a mass of brecciated schist about 150 feet in diameter. The breccia is cemented by sulfides, particularly pyrite, galena, and sphalerite, in the order named.

Workings, now filled with water to within 60 feet of the surface, include a shaft connected to two large glory holes by crosscuts.

The Oro Fino mine operated only during 1893, during which time 1,050 ounces of gold was recovered from about 5,000 tons of ore.

Ref.: 1, p. 57; 8, p. 130; 9, p. 587.

A-36, Puritan, Silver, Lead, Galena District, Lawrence County

Sometime before 1904, the Puritan Gold Mining & Milling Co. assembled a small group of claims totaling 56 acres on the headwaters of West Strawberry Creek. The group lies about 4 miles airline southeast of Lead in the W1/2 sec. 12, T. 4 N., R. 3 E. The caved collar of the shaft may still be seen along U. S. Highway 85A, 3.5 miles south of Pluma.

The ore, a lead-silver deposit in the flat-lying Deadwood formation, was developed with an 80-foot shaft and several hundred feet of drifting at the ore horizon. A small stamp and concentration mill was completed in 1904, but there is no record of any production from it after 1906. In the latter year, production of 2,500 tons of ore is reported with a value of $5,000. Additional development and reconditioning of the mine and mill were undertaken by the New Puritan Co. in 1916-17, but operations were suspended before production began. The 20-stamp mill was removed before 1925, the buildings wrecked by 1928, and in 1930 Ed Birdsall bought the property as a homesite.

Ref.: 2, p. 173; 61, 1904, 1906, 1916, 1917.

A-37, Rattlesnake Jack, Gold, Galena District, Lawrence County

The Rattlesnake Jack mine lies on the Rattlesnake Jack and Sunday claims in the SW1/4SW1/4 sec. 5 and extends a short distance into sec. 8, T. 4 N., R. 4 E It is in Strawberry Gulch about 1 mile west of Galena and about 5 miles airline southeast of Deadwood.

The ore occurs in a brecciated trachyte porphyry close to a fault. The breccia has subsequently been cemented with pyrite and silica. Connolly reports: "In the unoxidized ore all the gold is intimately associated with the pyrite. Rather hasty concentration tests (panning) at the School of Mines show this conclusively, as the pyrite concentrates assayed relatively high in gold, and the tailings practically nothing. Some very rich oxidized ore was taken from the mine. I have seen specimen ore, consisting of thoroughly decomposed porphyry completely shot through with fine wires and threads of native gold."

Principal workings, covering an area 200 by 300 feet, are reached by the Rattlesnake adit. Levels are also developed at depths of 52 and 155 feet below the adit level and connect to the main level by an underground shaft. Stoping above the main adit has extended to a surface open cut.

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Most of the 1937-41 production of Gilt Edge Mines, Inc., has come from the Rattlesnake Jack, a small part from the adjacent Gilt Edge Maid mine.

Ref.: 1, pp. 56-63; 11, pp. 111-114; 27, pp. 369-373; 36, pp. 101-102, 114.

A-38, Red Cloud, (M.S. 759), Silver, Lead,
Galena District, Lawrence County

The Red Cloud mine is located in a short steep gulch tributary to Bear Butte Creek near the west line of the NW1/4 sec. 3, T. 4 N., R. 4 E. in the Galena mining district.

The principal workings extend east into the hillside for approximately 320 feet. For about 180 feet the main drift follows a vertical contact between Deadwood dolomite and quartzite on the south and a mass of rhyolite porphyry to the north. Beyond that point it follows a series of vertical mineralized fractures cutting the upper ore horizon of the Deadwood formation. All workings were readily accessible in the fall of 1949.

The ore is thoroughly oxidized, and no recognizable minerals may be seen in the backs. However, Connolly reports seeing a few specks of residual galena and a little native silver in a piece of ore taken from a muck pile within the mine. Old reports indicate the presence of considerable native silver and horn silver in the richest ore pockets.

No production records are available, but the Red Cloud is listed among the more active small silver producers in the early production of the Galena district.

Ref.: 11, pp. 102-108.

A-39, Savage, (M.S. 372), Silver, Lead,
Galena District, Lawrence County

The Savage mine is located in the SE1/4 sec. 4, T. 4 N., R. 4 E., between the Custer and War Eagle mines. The adit is high on the south slope of Bear Butte Creek above the lower end of the old mining town of Galena.

The Savage is a member of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

The ore lies in the upper contact zone of the Deadwood formation about 70 feet below the white quartzite, which forms the top of the formation. Mineralization followed three sets of vertical fractures, whose bearings are N. 25° E., east-west, and S. 75°-85° E. The quartzite immediately below the ore zone is heavily cemented with manganese and iron oxides. The dip of the Deadwood varies from 8° to 16° to the north-east within the mine.

Workings, which consist of 3 small drifts trending northeast from the outcrop, underlie an area about 200 feet across. All were accessible in October 1949, although the portals were badly caved.

No production data are available; the mine was barely more than a lead-silver prospect.

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A-40, Olaf Seim, Gold, Pyrite,
Deadwood, Lawrence County

The Olaf Seim (Gotland) pyrite mine is located at the west edge of Deadwood, in secs. 22 and 27, T. 5 N., R. 3 E. It is due north of the Montezuma-Whizzers mine on the same vein. It lies on the Gotland and Gotland fraction claims (M.S. 1652), which are now owned by the heirs of Olaf Seim and James Nelson.

The ore occurs as a quartz-pyrite replacement in a black graphitic slate member of the pre-Cambrian Flag Rock formation. This particular unit, locally called the iron dike, has been traced from west of Deadwood to near Kirk, an outcrop distance of between 3 and 4 miles. On the Seim property the ore body has a strike slightly west of north and dips steeply to the east. The ore is pyrite with a very small quantity of chalcopyrite. Workings consist of an irregularly stoped out drift extending north from the outcrop on Deadwood Creek for roughly 800 feet. In the 30 years since the mine shut down quantities of melanterite and chalcanthite have formed on the faces of the stopes.

Early history of the mine is incomplete. It was worked as early as 1890. In 1900-1901, 50 tons per day were being shipped to the Deadwood smelter. The mine was reopened in 1918, when 1,150 tons of pyrite was mined. Of this, 916 tons, assaying 38 percent sulfur, were shipped to St. Louis. The returns ($7,200) were so small that no further shipments were made.

Ref.: 2, p. 173; 17, p. 28; 36, pp. 114-115; 61, 1918, p. 5.

A-41, Silver Queen, (M.S. 1584), Silver, Lead,
Galena District, Lawrence County

The Silver Queen, also known as the Queen and New Silver Queen, is located just north of the center of the south line of sec. 9, T. 4 N., R. 4 E In 1947 the Silver Queen, with several adjacent claims, was owned by Nels Thompson and H. H. Stewart of Deadwood, S. Dak.

Ore lies in the lower contact zone 20 feet above the base of the Deadwood formation. Numerous shallow drifts, following northeast trending verticals, have been driven from the outcrop and underlie an area about 600 by 700 feet. In 1949 most of the adits were caved; only two short drifts were accessible.

Mineralization has been described by Connolly as follows: "The ore in the Silver Queen occurs in flattened lenticular bodies conformable with the bedding. These bodies vary in thickness from less than an inch up to about two feet, and in diameter from a few inches to 15 or 18 feet. They are replacement bodies in a bed of somewhat dolomitic quartzite .....The ore itself is thoroughly oxidized, and little trace of primary minerals is left ..... Assays ..... show this material to contain much lead as well as high values in silver. They almost invariably show some vanadium, sometimes as high as five percent."

Incomplete reports indicate the production of $125,000 in silver from this property over a 4-year period in the early days of the camp.

Ref.: 11, p. 99; 12, pp. 188-198; 17, p. 29; 36, p. 12; 61, 1893, 1917.

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A-42, S. (Seth) R. Smith Group, (Two Bit, Comstock), Tungsten, Two Bit District, Lawrence County

The S. R. Smith group, consisting of the Two Bit No. 1, Two Bit No. 2, 4884, and Yellow Jacket fraction claims, is located on Two Bit Creek, near the center of sec. 1, T. 4 N., R. 3 E. The group totals 50.17 acres. In 1941, this group, together with the adjacent Mary group, was taken over by Pioneer Tungsten Mines, Inc.

Tungsten ore, primarily huebnerite, occurs as a replacement in dolomite immediately above the basal quartzite of the Deadwood formation. Mineralization follows a series of vertical fractures and cross fractures. The property has been explored by several short tunnels and discovery shafts. The only production has come from the Two Bit tunnel. This drift extends S 75° E. into the hillside for 145 feet. Seven north-south verticals were encountered; short crosscuts along four of them revealed little mineralization.

Prof. Jenny is reported to have found huebnerite on this property in the late 1800's, but the first commercial production is reported in 1916 when Sasse and Wolf leased the mine and produced 1,600 pounds of high-grade, hand-picked ore. Several tons of unshipped ore are still on the property.

Ref.: 12, p. 204; 14, p. 25; 36, pp. 97, 115.

A-43, War Eagle, (M.S. 1980), Silver, Lead, Galena District, Lawrence County

The War Eagle claim is located between the Savage and General Crook mines in the SE1/4 sec. 4 and the NE1/4 sec. 9, T. 4 N., R. 4 E. in the Galena (Bear Butte) mining district. It is part of the Double Rainbow group owned by DeWolfe Barton of Pierre, S. Dak.

The ore is a replacement in the upper ore horizon of the Deadwood formation. Mineralization followed three sets of vertical fractures, trending N. 25° E., east-west, and S. 70° E. The Deadwood dips to the northeast at about 10°. The ore itself is thoroughly oxidized to soft yellow-brown material and lies on a heavily manganese stained quartzite.

Workings consist of a main drift extending east into the hillside, with two small cross drifts trending northeast-southwest where the main adit cut mineralized cross joints. To the south of the main adit is a short drift and cross drift now caved. The total length of all workings is approximately 450 feet. The main workings were easily accessible in November 1949.

The mine was a very small lead-silver producer in the early days of the district.

A-44, Anchor Mountain, Gold, Galena District, Lawrence County

The Anchor Mountain property is located in secs. 5 and 6, T. 4 N., R. 4 E., about 1 mile airline northwest of Galena. According to Lincoln, the property consists of 780 acres, of which 360 acres are included in the patented Aurum group.

Mineralization occurs in the same quartz monzonite laccolith in which the Gilt Edge Maid is located; some is a replacement in the Deadwood formation into which the porphyry is intruded. The dominant mineral is auriferous pyrite.

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According to Lincoln, workings consist of a 150-foot shaft and 1,200 feet of lateral workings. In 1949 the shaft contained water, and all drifts on the hillside above the shaft were caved. Mill equipment has been removed and the buildings were being salvaged for lumber.

Despite the extensive development work in 1919-20 no production is recorded from the Anchor Mountain property.

Ref.: 1, p. 63; 36, p. 92; 61, 1919-20.

A-45, American Eagle, Gold Silver, Bald Mountain District, Lawrence County

The American Eagle gold mine was located in the NE1/4 sec. 35, T. 5 N., R. 2 E., at the present town of Trojan. The original American Eagle Mining Co. went out of existence in 1911, when their mine and cyanide mill was purchased by the newly organized Trojan Mining Co. The property is now owned by the Bald Mountain Mining Co. The original American Eagle mill built in 1908 forms the nucleus of the present Bald Mountain mill.

The ore was developed at the so-called upper-contact, about 20 feet below the base of the Scolithus sandstone, which forms the top of the Deadwood formation. Production records for the American Eagle mine are limited to the year 1909, when 82 tons of ore, yielding 40.63 ounces of gold and 429 ounces of silver, were produced.

Ref.: 1, p. 28; 58, pp. 161-187.

A-46, Apex, Gold, Silver, Bald Mountain District, Lawrence County

The Apex gold mine was located west of the Empire State, in the northeast corner of sec. 2, T. 4 N., R. 2 E. at Trojan. It was owned by Hugh McGovern as early as 1891, and was acquired by the Imperial Gold Mining Co. in 1904, along with the adjacent Northerly and Segregated Burlington claims. All three are now owned by the Bald Mountain Mining Co.

Ore was developed along vertical fractures cutting the upper ore horizon of the Deadwood formation. Production records are limited to 1891 and 1919. In the former year 11 tons of ore were valued at $297; in 1919, 75 tons of ore yielded 39.42 oz. gold and 56 oz. silver.

Ref.: 1, p. 28; 61, 1891, p. 59.

A-47, Baltimore Mine, (M S. 1648), Gold, Silver, Bald Mountain District, Lawrence County

The Baltimore and Richmond gold mine was located in the bottom of Nevada Gulch, near the center of the W1/2 sec. 1, T. 4 N., R. 2 E. Originally independent, it was acquired by the Trojan Mining Co. subsequent to 1904 and is now owned by the Bald Mountain Mining Co. It is not to be confused with the Baltimore and Chance claims in the NW1/4 sec. 2 of the same township, also held by the Bald Mountain Co.

The ore bodies followed three northeast-trending verticals. Mineralization along these fractures was a replacement of a thin dolomite lying just above the

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basal quartzite of the Deadwood formation. The mine was entered through a 330-foot shaft, which penetrated alternate beds of igneous rock and Cambrian shales and bottomed on the basal quartzite.

No separate production figures are available.

Ref.: 33, p. 200.

A-48, Ben Hur Mine, Gold, Silver, Bald Mountain District, Lawrence County

The Ben Hur gold mine was located in the SE1/4NW1/4 sec. 1, T. 4 N., R. 2 E. 3/4 mile southeast of Trojan. It is situated on the northernmost claim of the old Mogul Mining Co. property and was acquired by the Bald Mountain Mining Co. in 1939.

The ore occurs in the lower contact zone of the Deadwood formation. It lies between the basal quartzite and an overlying porphyry sill and is thoroughly oxidized. The main drift began in schist, encountered a porphyry dike, crossed a fault, and encountered ore. Mineralization is in 5 to 6 feet of dolomite and dolomitic shale and appears to be controlled by south and southwest trending vertical fractures.

The mine was little more than a prospect until 1898, but substantial shipments of ore are recorded for 1898 and 1899. It was absorbed by the Horseshoe Mining Co. shortly thereafter and was still producing when the Mogul Mining Co. took over the Horseshoe Co. in 1906. Subsequent to 1904 ore was raised through the Snowstorm shaft to facilitate shipment to the mill.

Ref.: 33, p. 200; 61, 1898, 1899.

A-49, Alameda, Gold, Silver, Bald Mountain District, Lawrence County

The Alameda gold mine was located on the south side of Green Mountain, in the NW1/4NW1/4 sec. 1, T. 4 N., R. 2 E. The property is now owned by the Bald Mountain Mining Co.

The ore body consisted of mineralized verticals trending N. 35° E. cutting the upper ore horizon of the Deadwood formation. The ore is a replacement in a 2-foot bed of dolomite overlain by a series of slightly dolomitic glauconitic shales. The Deadwood formation dips about 8° southwest.

Development was by opencut mining. Total production for the years 1904 and 1914-16 was 6,667 tons of ore yielding, 1,968.7 oz. gold and 3,682 oz. silver.

Ref.: 1, p. 28; 33, pp. 203-204.

A-49, Folger, Gold, Silver, Bald Mountain District, Lawrence County

The Folger gold mine was located on the south side of Green Mountain on the line between secs. 1 and 2, T. 4 N., R. 2 E. It was south of the Trojan mine and 150 feet east of the Alameda. The property, one of the holdings of the old Portland Mining Co., is owned by the Bald Mountain Mining Co.

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The mine was developed in the upper ore contact 25 feet below the top of the Deadwood formation. The dolomite in which replacement has occurred is separated from the Scolithus sandstone at the top of the Deadwood formation by about 15 feet of glauconitic shale. In this property mineralization has followed a minor vertical fracture, trending N. 30° E.

Although the mine was opened up before 1900, the only production figures available are for 1919, when 901 tons of ore yielded 231.68 oz. gold and 174 oz. silver.

Ref.: 1, p. 28; 33, p. 204.

A-50, Bald Mountain Mining Co., Gold, Silver,
Bald Mountain District, Lawrence County

The Bald Mountain Mining Co. was formed in 1928 as a reorganization of the old Trojan Mining Co. which operated in the Bald Mountain district from 1911 to 1923. Earlier history may be traced back to the discovery of gold on the property in 1877.

The company owns approximately 2,250 acres of mining claims lying south and west of Trojan in western Lawrence County. It produces ore from both the upper and lower ore horizons within the flat-lying Deadwood formation and operates a 325-ton cyanide mill at Trojan.

Allsman estimated the total production, through 1937, from holdings of the Bald Mountain Co. at about $12,000,000 in gold and silver. Production averaged about $1,000,000 annually before the wartime shutdown in 1942 and somewhat less subsequent to reopening in 1945.

Ref.: 1, pp. 26-36; 58, pp. 161-187.

A-50, Burlington and Golden Sands, Gold, Silver,
Bald Mountain District, Lawrence County

This old gold property lay to the northwest of the Leopard and Jessie Lee mines in the northeast corner of sec. 2, T. 4 N., R. 2 E. The property was independent until about 1900; since then it has been owned successively by the Trojan Co. and Bald Mountain Co. Its workings are currently incorporated in the Portland mine of the Bald Mountain Mining Co.

Mineralization occurred along a series of vertical fractures cutting the upper ore horizon of the Deadwood and trending about N. 35° E. The ore is a replacement in 2 or 3 thin dolomite beds interbedded with shale and lying about 20 feet below the uppermost sandstone of the Deadwood formation. At the south end of the claim, two 3-foot ore bodies were present, separated by about 6 feet of glauconitic shale.

The Burlington first shows up in production records in 1897, when $6,000 in free milling gold was recovered. The Golden Sands is reported as shipping ore in 1898.

Ref.: 33, p. 205; 61, 1898, 1897, pp. 50, 15.

A-50, Clinton, (Bald Mountain Mining Co.), Gold, Silver,
Bald Mountain District, Lawrence County

The old Clinton gold mine was located at Trojan in the NE1/4 sec. 2, T. 4 N., R. 2 E. It operated as early as 1896 on a group of claims owned by the original Clinton Mining Co. The property is now owned by the Bald Mountain Mining Co.

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The ore near the top of the Deadwood was a replacement in a 3-foot dolomite bed, separated from the overlying sandstone by 20 feet of glauconitic shale. Mineralization spread laterally from a series of vertical fractures, trending northeast. Most of the ore produced was the brown or oxidized variety, containing quartz, limonite, talc, and residual calcium and magnesium carbonates from the original dolomite.

Since the Bald Mountain Mining Co. took over the property in 1928, the old Clinton workings have been incorporated into their Portland mine. A drift driven from the Alaska-Ajax claims, following the lower ore horizon and extending out under many of the old upper contact mines, is now called the Clinton mine of the Bald Mountain Mining Co.

Production before the present ownership is summarized by Allsman. For 1902-6 and 1914-15, 23,437 tons of ore was mined, producing 7,088.22 oz. gold and 4,695 oz. silver.

Ref.: 1, pp. 26-36; 2, p. 170; 33, p. 206.

A-50, Perseverance, Gold, Silver, Bald Mountain District, Lawrence County

The Perseverance gold mine was located in the town of Trojan in the extreme northeast corner of sec. 2, T. 4 N., R. 2 E. It was one of the early properties operated by the old Portland Mining Co. and is now held by the Bald Mountain Mining Co.

The ore is found in a 3-foot bed of dolomite between 2 zones of glauconitic shale at the upper ore horizon of the Deadwood formation. Mineralization has been controlled by several vertical fractures trending N. 35° E.

No separate production figures are available for the individual properties operated by the Portland Mining Co.

Ref.: 33, p. 204.

A-50, Monday Group, Gold, Silver, Bald Mountain District, Lawrence County

The Monday group, consisting of the Monday, Reindeer, and Ofer claims, is located in the NE1/4 sec. 2, T. 4 N., R. 2 E. at Trojan. The Reindeer mine was an active independent producer as early as 1891. All early workings were on the upper ore horizon of the Deadwood formation. The group was acquired by the old Imperial Gold Mining Co. in 1904. In 1915, these holdings were taken over by the Ofer Co., who operated them in cooperation with the Mogul Co. until 1919. The Trojan Co. took over the Ofer holdings in 1921 but suspended operations themselves in 1923. The Bald Mountain Co. took over the property in 1928 and has incorporated the old workings in their Portland mine. The Clinton mine of the present company also extends beneath this group, operating on lower contact ores.

Ref.: 61, 1891, p. 58, 1892.

A-50, Mark Twain, Gold, Silver, Bald Mountain District, Lawrence County

The Mark Twain gold mine was located in the NE1/4 sec. 2, T. 4 N., R. 2 E. at Trojan. It was one of the more productive independent mines in the early days of

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the Bald Mountain district and is now part of the Portland mine of the Bald Mountain Mining Co.

The original ore body was developed at the upper ore horizon of the Deadwood formation, where two 2- to 3-foot beds of dolomite are separated by 5 feet of shale. Replacement in the dolomite occurred along a series of northeast-trending vertical fractures. In recent years the workings of the new Clinton mine have extended under this property mining ore developed at the lower contact just above the basal quartzite of the Deadwood formation.

Ref.: 33, p. 204; 61, 1891, p. 58.

A-50, Leopard-Jessie Lee, Gold, Silver, Bald Mountain District, Lawrence County

The Leopard-Jessie Lee gold mine was located on the north side of Green Mountain, a short distance east of Portland, in the NE1/4NE1/4 sec. 2, T. 4 N., R. 2 E.

The ore is developed in a 2-foot dolomite bed at the so-called upper contact zone of the Deadwood formation. A porphyry sill lies below the dolomite, and 20 feet of glauconitic shale separates it from the overlying Scolithus sandstone, which forms the top of the Deadwood formation. The ore is a replacement, spreading out as much as 40 feet in the dolomite, and is controlled by minor vertical fractures trending N. 20° E., N. 20° W., and due north.

Although the mine was operated intermittently in the 1890's, the only production record available is for 1919, when 201 tons of ore yielded 48.61 oz. gold.

Ref.: 1, p. 28; 33, p. 205.

A-50, Empire State, Gold, Silver, Bald Mountain District, Lawrence County

The Empire State gold mine lies under the Green Mountain at Trojan in the extreme northeast corner of sec. 2, T. 4 N., R. 2 E. The property was first located by A. J. Smith in 1877. It was one of the early holdings of the Portland Mining Co., and is now owned by the Bald Mountain Mining Co. It lies northeast of the Mark Twain, as both mines are on the same ore shoot in the upper part of the Deadwood formation.

The ore body on the upper contact is a replacement in a 2-1/2- to 3-foot dolomite lying between 2 beds of glauconitic shale. Mineralization follows a series of vertical fractures trending N. 25° to 35° E.

Workings of the new Clinton mine, on the lower ore horizon, now extend beneath the property.

Ref.: 11, p. 60; 33, p. 204; 59, p. 17.

A-51, Cole Construction Co., Limestone, Unorganized District, Lawrence County

The Cole Construction Co. operates a limestone quarry southeast of Spearfish, S. Dak., in sec. 26, T. 6 N., R. 3 E. The stone is crushed and used for concrete construction and in the manufacture of concrete blocks.

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The deposit is a flat-lying bed of Minnekahta limestone about 30 feet thick. Little or no overburden is present. The benches are drilled with wagon drills, blasted, and the material loaded into trucks with a power shovel. The crushing plant is only a few hundred feet from the quarry.

Ref.: S.D.M.I. Reports.

A-52, Crown Hill, Gold, Silver, Bald Mountain District, Lawrence County

The Crown Hill gold mine was apparently located in sec. 34, T. 5 N., R. 2 E. The property is now owned by the Bald Mountain Mining Co. Early day history of the property is very sketchy, and news notes and production data were usually reported in the lessor's name.

Production figures available for 1915-17 show 1,228 tons of ore produced, with a return of 331.01 oz. gold and 365 oz. silver.

Ref.: 1, p. 28.

A-53, Dakota Group, Gold, Silver, Bald Mountain District, Lawrence County

The Dakota group consisted of two small groups of claims in the Bald Mountain district operated by the Dakota Mining and Milling Co. between 1902 and 1907. One group, located in secs. 34 and 35, T. 8 N. and in adjacent parts of secs. 2 and 3, T. 4 N., R. 2 E., consisted of the Rehl, Lucy, Tiger, Mono, Puggy, Gunnison, and Vulcan claims. Of these, the Gunnison was probably the most productive. The other group, in the SW1/4 sec. 35, T 5 N., R. 2 E., comprised the Little Rock, Joseph, Jim, and Wedge. All ore was in the Deadwood formation.

The company began a shaft to the lower contact in 1904 and completed it in 1907. It is now used as the main shaft of the Dakota mine of the present owners, Bald Mountain Mining Co.

Production from the Dakota group for 1902-7 is given as 150,176 tons of ore, yielding 27,215.39 oz. gold and 7,718 oz. silver.

Ref.: 2, p. 172.

A-54, Decorah Mine, Gold, Silver, Bald Mountain District, Lawrence County

The old or upper Decorah gold mine was located on the eastern side of Green Mountain in the extreme northwest corner sec. 1, T. 4 N., R. 2 E., and extended north into sec. 35 of the adjacent township. The mine was operated independently until acquired by the Portland Mining Co. about 1900. It was bought by the Bald Mountain Mining Co. in 1928.

Ore at the upper contact zone is a replacement in a 2- to 4-foot bed of dolomite 20 feet below the Scolithus sandstone, which forms the top of the Deadwood formation. Mineralization follows two parallel verticals trending N. 35° E. The ore bodies vary from mere fractures to 100 feet in width in exceptional cases. Normally, the thickness is limited to that of the original dolomite bed, but locally it may extend upward as a narrow body into the overlying shale for several feet.

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Separate production figures are available only for 1917-18, when 3,341 tons of ore yielded 911.47 oz. gold and 894 oz. silver.

The present Decorah mine of the Bald Mountain Mining Co. is a lower contact mine, starting out on the old Dividend claim but now extending under adjacent claims, which were originally worked along the upper contact.

Ref.: 11, pp. 65, 69; 12, pp. 150-171, 310-311; 33, p. 203; 58.

A-54, Dividend (Decorah), Gold, Silver, Bald Mountain District, Lawrence County

The old Dividend gold mine is located near the south edge of sec. 35, T. 5 N., R. 2 E. on the north slope of Green Mountain.

The ore in the original workings was developed in the lower contact zone of the Deadwood formation overlying the basal quartzite. Mineralization is associated with vertical fractures, resulting in narrow ore bodies up to 5 or 6 feet in thickness. Two sets of fractures, trending north-south and N. 55° E., predominate. This lower contact ore was worked out and the mine abandoned in 1920. The present Decorah mine of the Bald Mountain Mining Co. is entered from the Dividend claim.

Production figures on the old Dividend are available for 1906-7, when 1,705 tons of ore yielded 313.08 oz. gold and 842 oz. silver.

Ref.: 11, pp. 65, 69; 12, pp. 150-171, 310-311; 33, p. 201; 58, pp. 161-172.

A-55, Homestake Limestone Quarry, Lime, Unorganized District, Meade County

The quarry and lime plant of the Homestake Mining Co. was at Calcite, S. Dak., about 4-1/2 miles northwest of Piedmont. Both the plant and the quarry probably were in the SW1/4 sec. 30, T. 4 N., R. 6 E.

The deposit mined was a bed of Minnekahta limestone of unusual purity. First opened in 1904, the quarry supplied about 70,000 tons of burned lime before it was closed in 1934.

Limestone from the quarry was burned in two 8-ton kilns. Almost all of the lime produced was used as a neutralizer in the cyanide plant of the Homestake Mining Co. at Lead, S. Dak., although a small amount was used to soften boiler water.

The operation was abandoned in 1934 because lime could be obtained more cheaply from commercial lime plants.

Ref.: 12, pp. 45, 287.

A-56, U. S. Gypsum Co., Gypsum, Unorganized District, Meade County

The Tilford mine and plant of the U. S. Gypsum Co. was near Tilford, S. Dak., in the S1/2 sec. 17, T. 4 N., R. 6 E. The property was active about 1940 but was closed during World War II. Since then the operation has been abandoned.

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Gypsum for the Tilford plant came from the Spearfish formation. This formation, composed largely of red shale and sandstone, contains extensive beds of gypsum that range in thickness from less than 1 inch to more than 25 feet. The bed mined at Tilford is known as the upper bed; it dips gently northeastward and is 15 to 25 feet thick.

Production is not known, as the U. S. Gypsum Co. operated several similar small mines in the area.

Ref.: 17, p. 31; 51, p. 181.

A-57, Sturgis Sandstone Quarry, Sandstone, Unorganized District, Meade County

Sandstone has been quarried near Sturgis, S. Dak., but none of the operations was extensive or long lived. The principal quarry, which supplied stone for buildings in Sturgis and nearby Fort Meade, is about 1-1/2 miles southwest of downtown Sturgis. The quarry probably is in sec. 17, T. 5 N., R. 5 E.

The deposit is in the Lakota member of the Dakota sandstone. Near Sturgis the Lakota is about 200 feet thick, but the formation is not uniform in texture or color. Most of the stone is a massive, coarse-grained, moderately hard, gray sandstone.

Production is not known. At present the quarry is not operating.

Ref.: 12, p. 291; 17, p. 12.

A-58, Gunnison and Vulcan, Gold, Silver, Bald Mountain District, Lawrence County

The Gunnison and Vulcan claims are in the NW1/4 sec. 2, T. 4 N., R. 2 E., 1/2 mile west of Trojan. Both were originally gold properties of the Dakota Mining & Milling Co. and now belong to the Bald Mountain Mining Co.

The Gunnison is reported by Irving to have developed ore at a somewhat lower horizon than the so-called upper contact upon which neighboring mines are located. Mineralization occurred in a series of thin dolomites interbedded with glauconitic shales.

The Gunnison was in operation at least as early as 1894 and was still producing in a small way in 1902.

The Vulcan, which is the next claim to the south, did not develop far beyond the prospect stage until after 1900.

The old workings on both of these claims are now part of the Portland mine of the Bald Mountain Co.

Ref.: 33, p. 206; 61, 1894, 1899.

A-59, American Colloid Co., Bentonite, Belle Fourche District, Butte County

The American Colloid Co. operates several small open-pit bentonite mines northwest of Belle Fourche in Butte County, S. Dak. Most of the land is held by the Belle Fourche Bentonite Products Corp. and is subleased to the company.

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The deposits extend northwest for 13 miles from Belle Fourche to the Wyoming State line. They average about 3 feet in thickness and are overlain by a few inches to 20 feet of upper Cretaceous Mowry shale. The bentonite is type 1 alkali bentonite and is known also as Wyoming bentonite. This bentonite will take up 6 to 7 times its weight in water and will expand to 15 times its dry volume. Most of the Belle Fourche bentonite is greenish yellow to olive green when mined.

After the overlying shale is stripped the bentonite is loaded into trucks by power shovels and hauled to a plant near Belle Fourche. Here it is crushed and dried and sacked for shipment.

Ref.: 12, pp. 317-332; 16, p. 4; 66.

A-60, Juno, (M.S. 1580), Gold, Silver, Bald Mountain District, Lawrence County

The Juno claim is located in the SE1/4 sec. 34, T. 5 N., R. 2 E. near Trojan. It was acquired by the old Imperial Gold Mining Co. about the turn of the century. From 1918 to 1920 it was under lease to Arpino and Oberto, who made steady shipments of ore to nearby mills. It is currently owned by the Bald Mountain Mining Co.

Ore was developed at the upper ore horizon of the Deadwood formation, about 20 feet below the white sandstone that forms the top of the formation. Production records are incomplete. In 1915, 270 tons of ore yielded 49.26 oz. gold and 57 oz. silver.

Ref.: 1, p. 28; 61, 1918, 1920.

A-61, Portland, Gold, Silver, Bald Mountain District, Lawrence County

The original Portland gold mine lies near the center of the north edge of sec. 2, T. 4 N., R. 2 E., just west of Trojan. It was discovered 2 or 3 years before 1880, in which year the old Portland Mining Co. was organized. Ore is a replacement in two or more thin dolomite beds lying in the Deadwood shales about 20 feet below the Scolithus sandstone, which forms the top of the formation. Mineralization follows a series of major fractures running N. 25° to 40° E.

Under the operation of the Trojan Mining Co. (1911-23), a haulage tunnel was driven under the property from adjacent claims to the north, and the ore from the Portland and adjoining properties was drawn through raises extending from the haulageway to the ore body 120 feet above. This haulageway now extends under numerous old and new mine workings on the upper contact ore body. This haulage system, plus all the old workings on about 30 claims in the NE1/4 sec. 2, is now known as the Portland mine of the Bald Mountain Mining Co.

Ref.: 1, pp. 26-36; 2, p. 170; 33, pp. 205-206; 58, pp. 161-172.

A-62, Reliance, Gold, Silver, Bald Mountain District, Lawrence County

A group of 35 mining claims on Annie Creek, previously known as the Ak-Sar-Ben, University, Bunker Hill, Iron Duke, and Monitor properties, was assembled by the Reliance Gold Mining Co. shortly after 1900. This block centered in sec. 3, T. 4 N., R. 2 E. A mill building was begun in 1906, and by the following year the company

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was producing from several claims. The company was reorganized as the New Reliance Co. in 1911, and the mill was remodeled. Operations were essentially continuous until suspended in November 1916.

Early operations, all of which were in ore developed in the upper contact zone of the Deadwood formation, centered on the Katie and Bunker Hill claims. During the last 2 years of operation diamond drilling was done to determine the nature of the lower contact zone, but no development was begun.

The Annie Creek Mining Co. took over the property in 1922, but, except for some examination and sampling work around 1935, nothing has been done with the property to date.

Lincoln gives the production before the shutdown of the mill in 1916 as $610,284. This may include some custom milling in 1915-16.

Ref.: 2, p. 161; 36, pp. 92-93; 61.

A-63, Snowstorm, Gold, Silver, Bald Mountain District, Lawrence County

The old Snowstorm gold mine was located about on the midpoint of the line between secs. 1 and 2, T. 4 N., R. 2 E. near the southeast edge of Trojan. It is now owned by the Bald Mountain Mining Co.

Early history of the property is that of an unsuccessful prospect. A shaft was sunk 345 feet to the basal quartzite, and extensive exploratory drifts were driven on the lower contact. In 1904 the shaft was unwatered and used by the Horseshoe Mining Co. for hoisting ore from their Ben Hur mine. Commercial ore was later found on the property as indicated by the production during 1914, 1916, 1921, and 1922. Total production in that interval was 1,063 tons of ore, yielding 379.69 oz. gold and 804 oz. silver.

Within recent years the new Clinton mine of the Bald Mountain Co. has been extended to connect with the old Snowstorm workings.

Ref.: 1, p. 28; 33, p. 202; 61, 1898, pp. 53-54.

A-64, Trojan, Gold, Silver, Bald Mountain District, Lawrence County

The Trojan gold mine lies in the extreme northwest corner of sec. 1, T. 4 N., R. 2 E., at the present town of Trojan. It is one of the properties of the old Portland Mining Co. taken over by the Bald Mountain Mining Co. in 1928.

The ore body was developed in a 4- to 5-foot bed of dolomite at the upper ore horizon of the Deadwood formation. Mineralization extended out from a vertical fracture trending N. 35° E. Mining resulted in an irregular stope 700 feet long and up to 85 feet in maximum width. At the south end the ore body is reported to have been divided by a rhyolite dike. High silver values were characteristic of the ore.

Production figures have been included with those of the other Portland properties and are not available for the individual mine.

Ref.: 33, p. 203.

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A-65, Two Johns (Rua Group), (M.S. 1213), Gold, Silver,
Bald Mountain District, Lawrence County

The original Rua group, consisting of 12 claims in the N1/2 sec. 34, T. 5 N., R. 2 E., was purchased by the Two Johns Mining Co. of Chicago in 1898. It became the property of the Trojan Mining Co. in 1917 and is now owned by the Bald Mountain Mining Co.

Ore occurs immediately above the basal quartzite of the Deadwood formation. In the older part of the mine a porphyry sill 500 feet thick has been intruded beneath the quartzite, raising the entire ore body by that amount. West of a north-trending fault of about 500 feet throw the sill is missing, and the ore body lies 500 feet lower. The latter is largely unoxidized blue ore. Development of the property began in the elevated part of the ore body as early as 1897. The ore body west of the fault is reached by way of an incline driven in 1929-30 from the valley of Squaw Creek.

Aside from scattered early production data, the only figures prior to recent operations are for 1915-17 when the mine was under lease to the Mogul Mining Co. In those years, 5,593 tons of ore, mined from the upper workings, yielded 1,469.07 oz. gold and 1,821 oz. silver. The present operators produced about 90 tons of blue ore per day from the lower level before shutting down the mine in June 1942.

Ref.: 1, pp. 26-36; 12, pp. 150-155; 33, p. 202; 61, 1897, 1916, p. 12, 1917, p. 10, 1918, p. 4.

A-66, Belle Fourche Bentonite Products Co., Bentonite,
Belle Fourche District, Butte County

The Belle Fourche Bentonite Products Co. of Belle Fourche, S. Dak., is primarily a leasing company. It controls at least 3,500 acres of ground along the outcrop of the Belle Fourche bed of bentonite that extends through parts of Tps. 8, 9, and 10, N., Rs. 1 and 2 E , from Belle Fourche to the Wyoming line. Included in the land held are 154 full size 20-acre claims and an 800-acre tract into which part of the claims overlap.

The deposit is a 3-1/2-foot bed of high-grade, type 1, high-swelling bentonite. At least 14,000,000 tons are available, and on 500 of the 3,500 acres held there is no overburden. Before 1929 the company mined and shipped several carloads of bentonite.

Ref.: 12, pp. 317-332; 16, p. 4; 46, pp. 45-48; 66.

A-67, Lewis Lime Plant, Lime, Unorganized
District, Lawrence County

H. H. Lewis of Spearfish, S. Dak., operated a small quarry and lime plant near Spearfish for many years. This plant, with a very small kiln, produced from 2,000 to 4,000 bushels of burned lime a year and operated from 1900 to 1928. Both the plant and the kiln were in the NE1/4 sec. 27, T. 6 N., R. 2 E., about 1-1/2 miles south of Spearfish.

The deposit is a flat-lying bed of Minnekahta limestone, which when burned produced a high quality lime that was sold locally.

Ref.: 12, p. 285.

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A-68, Spearfish Sandstone Quarry, Sandstone,
Unorganized District, Lawrence County

The old Spearfish quarry is in the SE1/4 sec. 16, T. 6 N., R. 2 E., near the southwest corner of Spearfish. Although the quarry has been idle for a number of years, it produced considerable sandstone for the construction of local buildings.

The deposit is a massive bed of Lakota sandstone. Most of the rock is a gray to buff stone that is relatively coarse grained. It frequently is cross bedded, but in places the material is uniform enough to quarry into large blocks.

Ref.: 12, p. 291.

A-69, Bion Mine, Gold, Silver, Pyrite,
Galena District, Lawrence County

The Bion, Chico, Bion fraction, and Lehigh claims comprise Mineral Survey 1749, near the southwest edge of the Galena mining district. The first two claims mentioned cover the east end of the small outlier of Deadwood formation lying in the NW1/4SW1/4 sec. 9, T. 4 N., R. 4 E. The latter two lie adjacent to the east in the valley of Bear Butte Creek, E1/2SW1/4 sec. 9, and can be regarded as placer prospects only.

Mineralization on the Bion and Chico occurs in the lower ore horizon of the Deadwood formation. It is a replacement in dolomites overlying the basal quartzite 12 to 20 feet above the pre-Cambrian contact. It is presumably identical with that in the Hayes, Alice, or Silver Queen mines, 2,000 to 3,000 feet to the southeast.

Sketchy reports indicate that mining was in progress on the Bion claim in 1901, but there is no record of production. It was apparently unimportant, for the mine was not mentioned by Irving in a report on the district in 1904. The reference may have been to a pyrite prospect in the graphitic schist exposed at creek level on the Bion fractional claim.

Ref.: 44, p. 16.

A-70, American Mining Co., Gold, Silver,
Ragged Top District, Lawrence County

The American Mining Co. was organized in 1898 by Kilpatrick Bros., railroad contractors and owners of the coal mines at Cambria, Wyo. They previously owned interest in the Flora E (Dacy) group of claims in the N1/2 sec. 29, T. 5 N., R. 2 E., and took option on adjacent property including the Balmoral group, the Eva H, Silver Tongue, and Silver Tongue fraction, Gossan claim, Iva claim, and Iva fraction, part of Gossan fraction, Eilenberg fraction, Norwich claim, and Grenville claim. The Dacy shaft was deepened to 505 feet, and a 530-foot diamond drill hole was sunk in the bottom of the shaft, presumably to the basal quartzite. On the strength of this hole, further land was acquired to the west, making a total of 2,100 acres under their control. Operations were transferred to Spearfish Canyon, where a 230-foot shaft was sunk near the mouth of Long Valley. Drifting was begun eastward toward the Dacy shaft and extended at least 2,000 feet before the project was dropped.

Ref.: 1, pp. 51-52.

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A-70, Dacy (Flora E) Group, (M.S. 1146), Gold, Silver,
Ragged Top District, Lawrence County

The Dacy group of gold claims lies in the center of the N1/2 sec. 29, T. 5 N., R. 2 E. 1/2 mile north of Ragged Top Mountain. Originally held by Dacy and Kilpatrick, in 1898 it became the nucleus of the large block assembled by the American Mining Co.

Mineralization follows a series of northeast-trending vertical fractures in the Pahasapa limestone. Silicified limestone along these fractures carries gold and some fluorite. Although the fractures continue with depth, values decrease rapidly, and have generally been found noncommercial below 50 feet from the surface.

A shaft on the Flora E claim was driven down along one of these fractures in 1896-98, in hope of encountering lower ore. The work was abandoned at 505 feet, and a diamond-drill hole below that depth penetrated an additional 530 feet before striking the basal quartzite of the Deadwood formation.

Production was limited to 1896-98, and all the ore came from shallow workings. The State Mine Inspector reported a gross value of $20,000 produced in 1897.

Ref.: 1, pp. 51-52; 17, p. 29; 33, pp. 173-175; 44, p. 32; 61, 1897.

A-71, Balmoral Group, (M.S. 1194), Gold, Silver,
Ragged Top District, Lawrence County

The Balmoral and Anchor group consists of about 20 claims located in secs. 28 and 29, T. 5 N., R 2 E. northeast of Ragged Top Mountain. The first discovery of the silicified gold ore in the Ragged Top area was made by F. M. Wall, who, with Rouse, Murray, and Madill, located the Balmoral group in 1896.

The ore occurred in silicified limestone adjacent to a series of northeast-trending vertical fractures in the Pahasapa limestone. Although the fractures could be followed to great depth, it was found that mineralization, in minable width, only extended 50 or 60 feet below the present surface.

Much of the mining was from open cuts and shallow drifts. Although prospects were opened on several of the claims in this group, the most productive seems to have been at the extreme north end on the Balmoral No. 8. Wall worked this under private lease, and, besides extensive surface workings, sank a shaft at least 90 feet.

Production from 1896 to 1898 is reported to have been $60,000. Any production subsequent to that date may have been reported as coming from mines of the American Mining Co.

Ref.: 1, p. 57; 2, p. 129; 33, p. 172; 61.

A-72, Deadwood Standard Gold Mining and Milling Co.,
Gold, Silver, Ragged Top District, Lawrence County

The Deadwood Standard Co. was organized in 1900 by Deadwood and Colorado interests to develop and operate the old Hanscha and Slavonian properties southwest of Ragged Top. These totaled about 210 acres of mineral claims in secs. 31 and 32, T. 5 N., R. 2 E., and extended down into sec. 5 of the adjacent township.

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A 125-ton mill was built near the head of Johnson Creek to treat the highly siliceous gold ore from the Pahasapa limestone. Operations were suspended in 1904 but were resumed on small scale while under lease to the Elk Mountain Mining & Milling Co. from 1912 to 1914 and 1916 to 1917. Total production, as given by Allsman, was 78,060 tons of ore yielding gold and silver valued at $11,983.29.

Ref.: 1, p. 52; 2, p. 172; 61, 1902-1906, 1912-1914.

A-73, Eagle Bird, (M.S. 1829), Gold, Silver,
Ragged Top District, Lawrence County

The Eagle Bird group is located on Squaw Creek, in the SE1/4 sec. 22, T. 5 N., R. 2 E., 2 miles airline northwest of Trojan. It originally consisted of 8 claims totaling 75 acres. The property was owned by Fred Pennington and associates as early as 1911, when development work was begun in a large mass of porphyry cut by mineralized fractures. An exploratory drift was begun by the Eagle Bird Mining Co. in 1921, and by 1926 it had reached a reported length of 2,600 feet.

The property was never placed in regular production. Some ore is reported to have been hand sorted from the dump and hauled to a local mill for treatment, but results are not available. The development ceased in 1926; between then and 1930 all equipment was sold off to raise money for taxes.

Ref.: 36, p. 100; 61, 1911, 1921-26.

A-74, Eva H and Silver Tongue, (M.S. 1144), Gold, Silver,
Ragged Top District, Lawrence County

These two claims, located in the NE1/4 sec. 29, T. 5 N., R. 2 E., were owned by Starner Brothers (Ragged Top Mining Co.) during their productive period from 1896 to 1898. In the latter year, they were taken under option by the American Mining Co. They are now part of the holdings of Ragged Top Mines, Inc., organized in 1938.

Ore occurred in a silicified limestone following a series of northeast-trending vertical fractures in the Pahasapa formation. Although the fractures continue with depth, it was found by experience that commercial gold values seldom extended more than 50 to 60 feet beneath the present surface.

Production from this group is reported by the State Mine Inspector for 1897 as 200 tons of ore valued at $12,000. If there was any mining from this property after that date, it was reported along with other production of the American Mining Co.

Ref.: 61, 1897-98.

A-75, Spearfish Gold Mining Co., Gold, Silver,
Ragged Top District, Lawrence County

The Spearfish Gold Mining Co. and Spearfish Gold Mining & Reduction Co. assembled several groups of claims totaling over 400 acres on the south and west sides of Ragged Top Mountain in 1900. Principal properties involved were the Metallic Streak, Hermitage, and Black Diamond groups. The block centers on the corner common to secs. 29, 30, 31, and 32, T. 5 N., R. 2 E.

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Ore, which was developed in fractures in the Pahasapa limestone, came principally from the Metallic Streak claims at the north end of the property. It was milled in a 250- or 300-ton dry crushing cyanide plant built in 1902 to replace a smaller plant, which burned after a short period of operation.

The company operated from 1899 to 1906, and produced 48,613.8 ounces of gold from about 315,000 tons of ore.

Ref.: 1, p. 52; 2, pp. 129, 173; 33, pp. 175-176; 44, p. 43; 61, 1902-6.

A-75, Metallic Streak, (M.S. 1486), Gold, Silver, Ragged Top District, Lawrence County

The Metallic Streak group lies northwest of Ragged Top, in the SE1/4 sec. 30, T. 5 N., R. 2 E. It was originally developed in 1897 by Hattenbach Brothers of Deadwood, but was combined with the Hermitage and Black Diamond groups to form the Spearfish Gold Mining Co. in 1900.

Ore was developed along vertical fractures cutting the Pahasapa limestone. Silicification along these fractures was accompanied by deposition of purple fluorite, gold, and silver. Thorough oxidation has made detailed study of the ore difficult. The ore was best developed near the top of the formation and usually became noncommercial 50 to 60 feet below the present surface. Development was by open cuts, shallow drifts, and short shafts. The property was operated from 1897 to 1906 and produced a large part of the gold credited to the Spearfish Gold Mining and Reduction Co.

Ref.: 1, p. 52; 2, p. 173; 33, pp. 175-176; 61, 1897-1906.

A-76, Ulster, (M.S. 1206), Gold, Silver, Ragged Top District, Lawrence County

The old Ulster gold mine is located northeast of Ragged Top Mountain, in the NW1/4 sec. 28, T. 5 N., R. 2 E. The Ulster group of 6 claims was owned or leased during its productive period by A. J. Smith and associates.

Silicification of the Pahasapa limestone follows vertical fractures probably associated with intrusion of porphyry sills and dikes. Gold is disseminated through the silicified limestone at least partly in the form of tellurides. Purple fluorite was a conspicuous feature of the ore. Values as high as $2,000 per ton were reported in a few instances.

Workings consisted of open cuts, 600 feet of shallow drifts, and 5 shafts, the deepest of which was 70 feet. As in other Ragged Top ores, commercial ore was largely confined to the surface 50 to 60 feet. Ore was being shipped from the Ulster as early as 1897, but there is no recorded production after 1899. Up to the latter part of 1897, total production from the Ulster claim was reported to be $22,000. Total production from the group has been estimated as high as $50,000.

Ref.: 1, p. 51; 17, p. 28; 33, p. 176; 61, 1897.

A-77, Victoria, Gold, Silver, Ragged Top District, Lawrence County

The Victoria Gold Mining & Milling Co., and a subsidiary known as the Victoria Extension, acquired and operated a group of claims on the divide between Squaw Creek

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and Spearfish Canyon from shortly after 1900 to about 1915. This block was located in secs. 16, 17, and 20, T. 5 N., R. 2 E. The Victoria Extension also located, about 1911, some of the old productive ground northeast of Ragged Top. The parent company also held about 180 acres of mineral land near Hornblende southeast of Rochford in Pennington County.

The ore bodies on the Squaw Creek property consisted of mineralized verticals in the Pahasapa limestone similar to those encountered around Ragged Top. A mill was built subsequent to 1904 and operated intermittently until 1915. Some of this later production apparently came from leased ground on the northeast side of Ragged Top Mountain. The only specific production figures are for 1912, when $14,672.92 in gold was recovered from 3,347 tons of ore.

Ref.: 2, p. 137; 61, 1911-13, 1915.

A-78, Old Ironsides, (M.S. 1384), Gold, Silver, Ragged Top District, Lawrence County

The Ironside or Old Ironsides group is located on Squaw Creek, in the S1/2 sec. 16 and the N1/2 sec. 21, T. 5 N., R. 2 E.

Mineralization, including some reported sylvanite, occurs along vertical fractures cutting a 40-foot porphyry sill within the Deadwood formation. The property was developed as early as 1899 by the Colorado-Deadwood Mining & Milling Co. No production was recorded. The property was taken over in 1913 by the Ironsides Mining Co., and some ore was shipped to a Denver smelter in 1913-14. No information is available on the smelter returns. Development, consisting of a long tunnel from Squaw Creek to intercept the ore at depth, was continued through 1915, but there is no record of any work since that date.

Ref.: 33, p. 97; 61, 1898, 1913-15.

A-80, Alpha-Platus, Gold, Silver, Ruby Basin District, Lawrence County

The Alpha-Platus gold mines lay on the north side of Nevada Gulch, near the center of the east edge of sec. 1, T 4 N., R. 2 E. They are among the most northerly workings of the Golden Reward group.

The ore bodies were developed along a series of north-south fractures cutting the lower ore horizon of the Deadwood formation, and were a northward extension, across Nevada Gulch, of the Tornado ore bodies. A series of minor north-south faults complicates the structure, and the 300-foot Tornado fault cuts off the mine to the west.

Development was through a 1,150-foot adit extending westward from the north side of Nevada Gulch. During the early days of the district, much medium-grade oxidized ore was produced from this group.

Ref.: 33, p. 192.

A-81, Big Bonanza, Gold, Silver, Ruby Basin District, Lawrence County

The Big Bonanza gold mine was located on the divide between Fantail and Stewart gulches in the E1/2SW1/4 sec. 6, T. 4 N., R. 3 E. Early history is obscure. The

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property was apparently operated independently in the early 1890's, but by the end of the century was operated by the old Clinton Mining Co. Lundberg, Dorr, and Willson acquired it before 1904 and operated it for several years thereafter to supply their cyanide mill at Terry.

The ore was a replacement in an 8- to 15-foot dolomite bed just above the basal quartzite of the Deadwood. Mineralization followed a series of closely spaced verticals trending from north to northeast, but spread laterally so that a large part of the claim was underlain by ore. Development was by drifts extending from the outcrop near the north end of the claim, and the workings were subsequently connected to those of the surrounding Golden Reward properties.

Ref.: 33, p. 186.

A-81, Little Bonanza, Gold, Silver, Ruby,
Basin District, Lawrence County

The Little Bonanza gold mine was one of the holdings of the original Golden Reward Gold Mining Co. at the time of its organization in 1887. It was located on the divide between Stewart and Fantail gulches in the SW1/4 sec. 6, T. 4 N., R. 3 E.

The ore was developed in a series of dolomite beds just above the basal quartzite of the Deadwood formation. Mineralization followed two north-south vertical fractures, resulting in two ore shoots, which merged in the central part of the property, only to split into several bodies owing to folding and minor faulting near the south end of the property. The deposit was separated from the Big Bonanza mine to the east by a nearly vertical, north-south dike. The ore was largely of the unoxidized, or blue variety.

The mine was developed by two tunnels extending south from Fantail Gulch.

Ref.: 33, pp. 187-188.

A-82, Boscobel and Double Standard Mines, Gold, Silver,
Ruby Basin District, Lawrence County

The Boscobel and Double Standard gold mines of the Golden Reward group lie under the divide between Fantail and Nevada Gulches in the SE1/4 sec. 1, T. 4 N., R. 2 E.

The ore bodies in these two mines consisted of a series of north-south mineralized fractures in the dolomite above the basal quartzite of the Deadwood formation. They are associated with a series of north-south trending rhyolite dikes and some minor faulting. Both lie on the upthrown side of the 300-foot Tornado fault and are consequently referred to as upper level workings. The ore in both mines was largely unoxidized and was characterized by the presence of green fluorite.

Both mines were developed from a drift extending slightly north of west from the head of Fantail Gulch and crosscutting the series of ore shoots.

The Double Standard was one of the original producing mines at the time the Gold Reward Mining Co. was organized in 1887.

Ref.: 33, pp. 197-198; 61, 1891, p. 58.

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A-83, Buxton, Gold, Silver, Ruby Basin District, Lawrence County

The Buxton gold mine was located on the divide between Nevada and Fantail Gulches, in the center of sec. 6, T. 4 N., R. 3 E. The property was operated independently until acquired by Lundberg, Dorr, and Willson about 1903.

The ore was developed just above the basal quartzite of the Deadwood formation. Mineralization followed the usual pattern of north-trending verticals of the area. The mine was developed by drifts extending inward from both sides of the divide. Because of the high topographic position, workings were close to the surface, and the ore was highly oxidized.

A mill was built on the property in 1886. The mine was in steady operation in the early 1890's, producing about 2,000 tons of ore a year. Early day oxidized ore was apparently treated in a small chlorination plant. After 1904 the mine supplied ore for the Lundberg, Dorr, and Wilson cyanide mill at Terry.

Ref.: 33, p. 184; 61, 1891, p. 57.

A-83, Lundberg, Dorr and Wilson, Gold, Silver, Ruby Basin District, Lawrence County

This company, organized about 1902, acquired several productive properties near Terry, in the center of sec. 6, T. 4 N., R. 3 E. These included the Big Bonanza, Buxton, Retriever, and Clinton mines, all of which produced gold ore from the lower ore horizon of the Deadwood formation.

A 100-ton cyanide mill at Terry was put into operation in 1904. This continued to operate upon ore from their own mines and as a custom mill until late 1913. Production from the Lundberg, Dorr, and Wilson property, from 1902 to 1913, is listed by Allsman as 219,068 tons of ore yielding 43,616.89 oz. gold and 60,088 oz. silver.

Ref.: 1, pp. 39-40; 61, 1904, 1905, 1906, 1911, 1912, 1913.

A-84, Clinton, Gold, Silver, Ruby Basin District, Lawrence County

The Clinton mine in Nevada Gulch was located in the west central part of sec. 6, T. 4 N., R. 3 E. Before it was acquired by Lundberg, Dorr, and Wilson about 1903, it was operated by the old Clinton Mining Co., which operated the Clinton and Portland properties at Trojan.

The ore occurred as a replacement in the dolomite immediately overlying the basal quartzite of the Deadwood. Mineralization followed a series of small vertical fractures trending from N. to N. 20° E.

Mining was by means of a long drift extending from the bottom of Nevada Gulch. This was driven 60 feet below an irregular porphyry sill, which cuts gradually across the sediments and lies beneath the basal quartzite in mines to the east. The mine was a minor producer of medium-grade, oxidized ore before 1900.

Ref.: 33, pp. 191-192.

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A-85, Daisy, Gold, Silver, Ruby Basin District, Lawrence County

The Daisy was a small, early-day gold mine belonging to the Golden Reward Consolidated Gold Mining & Milling Co. It was located on the divide between Fantail and Stewart Gulches, near the center of the south line of the SE1/4 sec. 1, T. 4 N., R. 2 E.

The ore lay in replacement bodies following vertical fractures through the uppermost dolomite beds in the Deadwood formation. This is the easternmost recorded occurrence of mineralization at the upper contact in the Bald Mountain-Ruby Basin area.

Workings were close to the surface and consisted of trenches and shallow drifts in the weak green glauconitic shales and thin dolomites in which the ore was developed.

Early history of the mine is not known, but the Daisy was in production as early as 1897.

Ref.: 33, p. 200.

A-86, Dark Horse and General Grant, Gold, Silver, Ruby Basin District, Lawrence County

The Dark Horse and General Grant mine was located in Nevada Gulch, on the southwest side of Bald Mountain in the SW1/4NE1/4 sec. 1, T. 4 N., R. 2 E. The property has gone through many hands and is currently held by the Bald Mountain Mining Co.

Little is recorded about the history of the property. It was apparently fairly well worked out in the early 1890's. Ore was from the lower ore horizon of the Deadwood formation. Development was by extensive drifting along north-south verticals.

Allsman lists production from the Grant and Dark Horse in 1919 as 46 tons, yielding 9.94 oz. gold and 31 oz. silver, but the mine had apparently been inactive for many years before that date.

Ref.: 1, p. 28.

A-87, Fannie, Gold, Silver, Ruby Basin District, Lawrence County

The Fannie (Maggie) mine of the Golden Reward Gold Mining Co. was located in the SE1/4SW1/4 sec. 6, T. 4 N., R. 3 E. 3 miles southwest of Lead.

A 265-foot shaft sunk in the middle 1890's by the Deadwood and Delaware Mining Co. at their Maggie mine encountered an ore body above the basal quartzite of the Deadwood formation. The Golden Reward Co. took over the property in 1899. Subsequently, four ore bodies were discovered. All were at the same stratigraphic horizon, but were displaced as much as 40 feet vertically from one another. Displacement was due to an intrusion of porphyry cutting irregularly across the Deadwood beds.

When finally developed, the ore body proved continuous with that in the Bonanza and Little Bonanza mines to the north and in the Sundance mine to the south.

Ref.: 33, pp. 186-187.

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A-88, Golden Reward, Gold, Silver, Ruby Basin District, Lawrence County

The original Golden Reward gold mine was located on the divide between Fantail and Stewart Gulches, in the SW1/4SE1/4 sec. 6, T. 4 N., R. 3 E.

The ore was developed at the lower ore horizon and lay either upon the lower quartzite of the Deadwood or upon a porphyry sill. Mineralization followed two sets of vertical fractures, one set nearly north-south the other trending N. 30° E. Where these systems intersected and were closely spaced, ore bodies of considerable width resulted. One stope is reported to have been developed to a width of 340 feet.

The ore body was developed by open cuts at the north end of the property and by shallow drifts and stopes to the south. Workings were connected to the Stewart mine to the east and to the Bonanza to the west.

The mine was in production at the time of the organization of the Golden Reward Gold Mining Co. in 1887, but no separate production figures have been preserved.

Ref.: 33, pp. 185-186.

A-88, Golden Reward Gold Mining Co., Gold, Silver, Ruby Basin District, Lawrence County

The Golden Reward Gold Mining Co. was organized in 1887 by consolidating several smaller properties, including the Golden Reward, Stewart, Double Standard, Little Bonanza, and Harmony gold mines. The company was reorganized as the Golden Reward Consolidated Gold Mining & Milling Co. in 1898. The Deadwood and Delaware mining properties and the smelter at Deadwood were acquired in 1899. By the time of the final suspension of operations in 1918, the company held more than 440 mining claims in the Ruby Basin district southwest of Lead, in addition to its milling and smelting operations. The company remains as the second largest gold producer in the Black Hills, with a total production estimated at $21,000,000.

Ref.: 1, pp. 38-39; 2, p. 172; 61, 1918, pp. 4-5.

A-88, South Golden Reward, Gold, Silver, Ruby Basin District, Lawrence County

The old South Golden Reward gold mine underlay the south ends of the Golden Reward and Silver Case claims, in the SW1/4SE1/4 sec. 6, T. 4 N., R. 3 E. These claims formed part of the original holdings at the time the Golden Reward Gold Mining Co. was organized in 1887.

The ore was developed in a series of four sub-parallel, coalescing shoots lying on the basal quartzite of the Deadwood formation. Mineralization extended irregularly over an area about 750 feet north and south and 450 feet east-west. The ore body in this mine was elevated above that in mines to the east and west by an intrusion of phonolite just below the quartzite. This elevation of the lower contact permitted the mine to be worked through a series of four tunnels driven in the south side of the divide between Fantail and Stewart gulches. Workings were inaccessible as early as 1898.

Ref.: 33, p. 188.

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A-88, Stewart (Steward), (M.S. 316), Gold, Silver, Ruby Basin District, Lawrence County

The Stewart gold mine was one of the first properties operated by the Golden Reward Gold Mining Co. It was located on the divide between Fantail and Stewart Gulches, in the SW1/4SE1/4 sec. 6, T. 4 N., R. 3 E.

The ore body, developed in a dolomite bed just above the basal quartzite of the Deadwood formation, extended approximately north and south for 1,160 feet. Mineralization was controlled by two sets of vertical fractures; a major north-south set and a secondary set trending N. 30° E. The ore was all highly oxidized and is reported to have carried particularly high values in gold and silver.

The workings, which were very close to the surface, consisted of two main drifts, with cross drifts and stopes to outline the irregularities of the ore body.

Ref.: 33, p. 185; 44, pl. 12.

A-90, Hardscrabble, Gold, Silver, Ruby Basin District, Lawrence County

The Hardscrabble gold mine lies on the line between secs. 1 and 12, T. 4 N., R. 2 E., near the head of Fantail Gulch. The mine was purchased by the Horseshoe Mining Co. in 1894 and is now owned by the Mogul Mining Co.

The ore was developed on the lower contact of the Deadwood formation and followed several minor vertical fractures trending N. 20° E. The structure was complicated by a series of small dikes and sills intruded into the Deadwood. Quantities of purple fluorite are reported in the ore and in the associated rhyolite.

Mining was by open cut and by stoping from a tunnel driven westward to intersect the various shoots. A drift also connected the Hardscrabble to the adjacent Welcome mine. Production was intermittent during the 1890's, but complete records are not available.

Ref.: 33, p. 199; 61, 1894, p. 14.

A-90, Harmony, Gold, Silver, Ruby Basin District, Lawrence County

The old Harmony gold mine lies astride the south line of the SE1/4 sec. 1, T. 4 N., R. 2 E. It is one of the older mines in the area, having been in production at the time the Golden Reward Gold Mining Co. was organized in 1887, and was still in operation in a small way in 1894.

The ore body lay just above the basal quartzite of the Deadwood formation. Mineralization resulted from replacement along a series of minor fractures cutting the basal dolomite. Individual ore shoots along these fractures trended N. 5° to 10° E. The mine was on the upthrown (west) side of the Tornado fault. The workings lay 300 feet above those of the adjacent Tornado mine and were consequently referred to as upper level workings in early reports. Mining was conducted through two drifts extending into the hillside above Fantail Gulch.

Ref.: 33, p. 199.

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A-92, Isadorah and Billie, (M. S. 1062), Gold, Silver, Ruby Basin District, Lawrence County

The Isadorah and Billie gold mines were located on the divide between Stewart Gulch and North Fork of Whitetail Creek, in the NE1/4 sec. 7, T. 4 N., R. 3 E. They underlie the Rock Bluff, Billie, and Isadorah claims.

Both were developed on north-south ore shoots lying on the basal quartzite of the Deadwood formation. A heavy sill-like intrusion of porphyry cuts across the Deadwood beds in such manner that on the west end of these claims the ore body lies above the porphyry, whereas on the east end it is below the igneous mass. The uplifted westerly ore body was developed by the Isadorah drifts, the eastern end by tunnels of the Billie mine, lower on the hillside adjacent to the Whitewood Creek.

Both were early-day mines of the Golden Reward group. The Isadorah was in production in 1899, and the Billie is listed as producing blue ore for the Golden Reward roaster as late as 1914.

Ref.: 33, p. 188.

A-94, Little Tornado, Gold, Silver, Ruby Basin District, Lawrence County

The Little Tornado gold mine was located near the center of the SE1/4 sec. 1, T. 4 N., R. 2 E., on the Tornado and Silver fraction claims of the Golden Reward group.

Several sub-parallel ore bodies trending north-south occur in the dolomite immediately above the basal quartzite of the Deadwood formation. They are separated from the main Tornado ore body by the 300-foot Tornado fault, which has raised them to the point where they were worked from a tunnel rather than a shaft. They are consequently referred to in the literature as upper workings, even though developed on the lower ore-bearing horizon. Because of drag toward the 300-foot fault, the more easterly parts of the mine lay at a lower elevation.

The mine was a minor producer of oxidized ore before 1898.

Ref.: 33, p. 197.

A-96, Mogul-Horseshoe Co., Gold, Silver, Ruby Basin District, Lawrence County

The old Mogul-Horseshoe property consisted of 84 claims located 3 miles southwest of Lead, principally in secs. 1 and 12, T. 4 N., R. 2 E.

The nucleus of the Horseshoe group, the Welcome, Horseshoe, and Hardscrabble mines, was assembled before 1893 by the Horseshoe Mining Co. The 305-foot Mogul shaft was sunk to the lower contact by 1897. In 1902, the company bought additional claims, purchased the newly built National Smelter at Rapid City, converted the Kildonan chlorination plant at Pluma into a 300-ton cyanide mill, and in 1903 completed a 500-ton cyanide mill at Terry. The Mogul interests took over the Horseshoe Co. in 1905. The mill at Terry burned down in 1906, and the Pluma mill was destroyed by fire in 1912. A 150-ton mill was completed at Terry in 1914. After 1915, much of the ore treated came from leased properties. The Mogul Co. suspended operations in October, 1919. All but two claims of the Mogul Co. were purchased by the Bald Mountain Mining Co. in 1939.

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Principal mines operated by the company were the Mogul, Horseshoe, Hardscrabble, Welcome, Upper Welcome, and Ben Hur. All but the latter two were on the lower contact of the Deadwood formation.

The total value of gold and silver credited to the Mogul Mining properties by Allsman is over $7,000,000.

Ref.: 1, pp. 37-38; 2, p. 172; 36, pp. 110-111; 61, 1902, p. 14-15, 1919-20, p. 8.

A-96, Great Mogul Mine, Gold, Silver,
Ruby Basin District, Lawrence County

The Great Mogul mine of the old Mogul Mining Co. lies along the eastern edge of the NE1/4 sec. 12, T. 4 N., R. 2 E., 3 miles southwest of Lead in the old Ruby Basin mining district. It was acquired by the Bald Mountain Mining Co. in 1939.

The ore body was developed just above the basal quartzite of the Deadwood formation. Replacement of a 5- to 10-foot dolomite bed followed a north-south fracture zone. The ore body is a southward continuation of the Tornado shoot of the Golden Reward Co. Just to the west of the main ore body on the Mogul property, but separated from it by a porphyry dike and a fault with up to 100 feet of throw, is a second smaller shoot, essentially parallel to the main one.

The mine was developed through a 305-foot shaft, which bottomed in pre-Cambrian schist about 250 feet east of the main ore body. This shaft was sunk in 1897 by the Horseshoe Co. in a successful search for the southern extension of the Tornado ore shoot.

Ref.: 33, pp. 196-197.

A-97, National Gold and Silver Co., Gold, Silver,
Ruby Basin District, Lawrence County

The National Gold and Silver Mining Co., owned by Zipp and Treber, acquired a group of 4 claims centering in the NW1/4SW1/4 sec. 8 and extending over into sec. 7, T. 4 N., R. 3 E.

In 1896-97 a 280-foot shaft was sunk on the line between the Golden Eagle and Andres claims. Extensive lateral drifting was done along the basal quartzite in an unsuccessful search for ore similar to that in the Union ore body 1,000 feet to the west.

The property was taken over by the Golden Reward Consolidated Gold Mining & Milling Co. some time between 1904 and 1913.

No production has been recorded from the original group of claims.

Ref.: 61, 1897, p. 26.

A-98, Retriever, Gold, Silver, Ruby Basin
District, Lawrence County

The Retriever gold mine was located on the Rebecca claim, in the SE1/4NW1/4 sec. 6, T. 4 N., R. 3 E. The property was acquired by Lundberg, Dorr, and Wilson before 1904.

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The ore body was a long, narrow, north-south-trending shoot, developed in a dolomite just above the basal quartzite of the Deadwood formation. Locally a porphyry sill has been intruded below the quartzite, and thus elevated the ore horizon considerably above the same zone in the Clinton mine to the west. A smaller sill immediately overlay the ore.

The mine was developed in the divide between Nevada and Fantail Gulches and was entered by drifts extending in from both sides of the ridge.

Ref.: 33, pp. 184-185.

A-99, Ross Hannibal, Gold, Silver, Ruby Basin District, Lawrence County

The Ross Hannibal group, consisting of the Hannibal, North Star, and Mikado (?) mines, was located in the center of sec. 7, T. 4 N., R. 3 E. The mines, in operation in the early 1890's, were bought by the Deadwood and Delaware Co. in 1892. They were essentially worked out when taken over by the Golden Reward Co. in 1899.

A long ore shoot, lying on the basal Deadwood quartzite, has been elevated by an irregular sill. The ore body, as finally developed, was from 5 to 100 feet wide, 4 to 8 feet high, and extended in a north-south direction for nearly 2,000 feet. The ore was highly siliceous, unoxidized, and contained much fluorite. Development was through two drifts, one opening on Whitetail Creek, the other on the north fork of the same creek. Some opencut mining was done on the North Star claim to the north and west of the main ore body.

Production figures are incomplete. In 1891, the mine produced 375 tons of ore with an average value of $35 per ton.

Ref.: 33, pp. 189-190; 61, 1891, 1894.

A-100- Ruby Belle (M.S. 538), Gold, Silver, Ruby Basin District, Lawrence County

The workings of the old Ruby Belle gold mine lie on the divide between the north and south forks of Whitetail Creek in the NE1/4 sec. 7, T. 4 N., R. 3 E.

Two heavily mineralized ore shoots, diverging toward the south, lay just above the basal quartzite of the Deadwood. The ore was thoroughly oxidized. The eastern shoot proved to be a continuation of the main or No. 1 Union shoot. A slight extension of the western body was encountered in a drift extending west from the Union shaft.

The Ruby Belle was developed by two tunnels extending in from the outcrop. One extended southeast from the north fork of Whitetail Gulch the other southwest from the south or main fork of the same creek.

The mine was in production as early as 1894, became the property of the Golden Reward Mining Co. before 1897, and was still producing in 1899.

Ref.: 33, p. 189.

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A-103, Sundance (M.S. 899), Gold, Silver, Ruby Basin District, Lawrence County

The Sundance mine of the Golden Reward Mining Co. was located in Stewart Gulch in the NW1/4 sec. 7, T. 4 N., R. 3 E.

A 265-foot shaft was sunk on the Sundance claim in the middle 1890's, and ore was located by drifting eastward along the basal quartzite of the Deadwood formation. A very large ore body, up to 10 feet thick, was encountered. Mineralization was controlled by a series of north-south fractures, but replacement was so extensive locally that a blanket type of deposit resulted. The most extensive development was under the Silver Hill claims 600 feet southeast of the shaft. The ore body subsequently proved to be a southward extension of the Fannie shoot.

The great quantity of high-grade, oxidized ore made this one of the principal mines of the Golden Reward Co.

Ref.: 33, p. 188.

A-104, Tornado, Gold, Silver, Ruby Basin District, Lawrence County

The Tornado mine underlies at least 12 claims centering in the SE1/4 sec. 1, T. 4 N., R. 2 E. but extending east into sec. 6 of the next township. It was one of the principal mines of the Golden Reward group.

A series of strongly mineralized ore shoots lies in the dolomite above the basal quartzite of the Deadwood formation. These trend essentially north-south and are associated with several dikes and minor faults. One fault with a 300-foot downthrow to the east lies just west of the main workings. Although the ore body crops out in Nevada Gulch, most of the development has been through the 315-foot Tornado shaft in Fantail Gulch. The strongest of these ore shoots extends south, where it is known as the Mogul shoot of the Mogul (Horseshoe) Mining Co.

The Tornado has been the most productive mine of the Golden Reward group, but separate production figures are not available.

Ref.: 1, pp. 38-39; 33, pp. 192-196, pl. XIX.

A-105, Union Mine, Gold, Silver, Ruby Basin District, Lawrence County

The Union mine of the Golden Reward group was entered by a 107-foot shaft located in Whitetail Gulch, near the center of the E1/2 sec. 7, T. 4 N., R. 3 E.

Four main north-south ore bodies were encountered in drifting westward from the shaft, along the top of the basal quartzite. The No. 1 shoot, 100 feet west of the shaft, ranged from 50 to 200 feet in width, 8 feet in height, and showed an ultimate length of nearly 3,000 feet. It was developed in a dolomite lying between the basal quartzite and the overlying shale section. The ore bodies 2, 3, and 4 lay, respectively, 650, 1,500, and 1,925 feet west of the shaft. These were much smaller, and lay about 5 feet above the quartzite on a nonmineralized dolomite bed. The roof was either shale or the bottom of an irregular phonolite sill.

This mine was one of the big producers of the old Deadwood and Delaware Co. in the 1890's, and was still a very active property when taken over by the Golden Reward Consolidated Gold Mining & Milling Co. in 1899.

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Ref.: 1, pp. 38-39; 33, pp. 190-191.

A-106, Upper Welcome, Gold, Silver, Ruby Basin District, Lawrence County

The old workings of the Upper Welcome gold mine are located high on the northwest slope of Fantail Gulch at about the center of the north line of sec. 12, T. 4 N., R. 2 E. They were part of the original Horseshoe holdings and are now owned by the Mogul Mining Co.

The ore was developed in the upper part of the Deadwood formation, about 20 feet below the upper quartzite. This was one of the very few upper contact ore deposits east of the divide between Terry Peak and Bald Mountain. Mineralization was by replacement along a series of north-south vertical fractures cutting the uppermost dolomite bed, but lateral replacement of the dolomite was not well developed.

The deposit was small and was probably worked out before 1898.

Ref.: 33, pp. 200-201.

A-109, Beaver Creek Mining Co., Tin, Tinton District, Lawrence County

Holdings of the Beaver Creek Mining Co. center in the extreme southeast corner of sec. 17, T. 5 N., R. 1 E. 2 miles northeast of Tinton. The company was formed in 1934 to operate 11 patented claims previously known as the Lineal lodes. Development continued through 1935.

Old workings included a 125-foot shaft and 150 feet of exploratory drifting in porphyry.

Workings were inaccessible in 1949 because of a cave at the collar of the shaft.

Ref.: 36, pp. 93-94; 60, pl. 90.

A-110, Black Hills Tin Co., Tin, Tinton District, Lawrence County

The Black Hills Tin Co. is the present holder of a large block of lode and placer ground in the Tinton area in extreme western Lawrence County. Most of the tin-bearing pegmatites are in secs. 19 and 30, T. 5 N., R. 1 E., but placer and lode holdings in adjacent sections extend the total ground controlled by the company to about 2,700 acres.

Placer tin was identified in the area in 1876, and lode tin was found in the pegmatites in 1886. Consolidation of the most promising tin-bearing property was inaugurated by the American and Cleveland Tin Mining Co. in 1889. The Tinton Mining Co. did further exploratory work in 1902-3; a successor, the Tinton Reduction Co., made shipments of concentrates to England in 1909-10, and the present company took over the property in 1927. Since that time the property has produced limited quantities of tin, columbite-tantalite, spodumene, amblygonite,and gold.

The principal lodes held by the company include the Giant-Volney, Rough and Ready, and Spearfish. Placer ground extends along tributaries of Sand Creek, and along Potato Creek, Bear Gulch, and its several tributaries.

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Ref.: 2, p. 173; 28; 32; 60.

A-111, Giant-Volney, Tin, Tinton District, Lawrence County

The Giant-Volney property is located on claims of the same name in the SW1/4 sec. 19, T. 5 N., R. 1 E. near Tinton. It constitutes one of the most important holdings of the Black Hills Tin Co.

The workings are situated near the south end of a mass of coalescing pegmatite dikes having a width of up to 300 feet and an overall length of roughly 1,500 feet. The dikes strike slightly west of north and dip steeply to the west. Three adits have been driven through the dike in search of tin, but the only commercial mining has been done for tantalum and lithium minerals. The Tantalum mine, from which these have been taken, consists of a large glory hole, a 60-foot inclined shaft, and about 200 feet of drifts and crosscuts. Diamond drilling by the Bureau of Mines in 1939-40 consisted of 1,122 feet of exploratory hole beyond and below the present workings.

The only commercial production from the Giant-Volney property has been the small quantity of tantalite and amblygonite mined under lease to the Fansteel Metallurgical Corp. in 1935-38.

Ref.: 28; 32; 60, pp. 626-628.

A-112, Keenan Properties, Gold, Tungsten, Tin, Tantalum, Tinton District, Lawrence County

A large group of lode and placer ground east of Tinton has been consolidated by Peggy Keenan of New York, N.Y., and Spearfish, S. Dak. This includes the old Dakota tin and gold (John White) property located in the NE1/4 sec. 30, T. 5 N., R. 1 E., but placer ground extends 1 mile east along Potato Creek and 3 miles north along Bear Creek. Much of this ground has been worked intermittently as placer ground since 1876, and a small concentrating unit was still in operation on Potato Creek in 1949.

Numerous prospect holes are scattered over the lode claims. The most extensive workings are on the Homeward Bound claim, where a tin-bearing pegmatite dike occurs. This dike strikes essentially north-south and dips about 45° west. Width varies from 4 to 9 feet, and it has been traced along the strike for 475 feet.

Old production records are lacking. Within recent years several hundred pounds of concentrates, carrying gold, cassiterite, columbite-tantalite, and scheelite, have been shipped from the placer ground along Potato Creek and Bear Creek.

Ref.: 13, p. 29; 24; 32; 60, p. 630.

A-113, Rough and Ready, Tin, Lithium, Feldspar, Tinton District, Lawrence County

The Rough and Ready mine of the Black Hills Tin Co. is located in the NW1/4SW1/4 sec. 19, T 5 N., R. 1 E. at Tinton. It is developed in a northward extension of the Giant-Volney pegmatite described elsewhere in this report.

The mine has been developed on 3 levels. The highest level includes a 540-foot adit and 1,400 feet of crosscuts and drifts. The intermediate level is 28 feet lower, and 60 feet below the adit level is the winze level with a 200-foot drift. A 155-foot inclined shaft connects the intermediate level to the surface. The Bureau of Mines did 4,000 feet of diamond drilling in 1939-40 to explore the dike at depth.

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Most of the lode tin from the area has come from this mine. A total of 14,330 tons of pegmatite mined before 1911 yielded 104,987 pounds of metallic tin. Only a few hundred pounds have been produced since that date, in part a byproduct from milling of the pegmatite to produce spodumene and feldspar.

Ref.: 13, p. 29; 24; 32; 60, pp. 620-625.

A-114, Spearfish and Centaur, Tin,
Tinton District, Lawrence County

The Spearfish and adjacent lode claims lie along Bear Gulch, in the SW1/4SE1/4 sec. 19 and in the NW1/4NE1/4 sec. 30, T. 5 N., R. 1 E. They are held by the Black Hills Tin Co.

Several separate cassiterite-bearing dikes on the Spearfish claims were explored by open cuts, shafts, and diamond drilling as early as 1910, and a 400-foot adit was driven into the largest dike in 1934. Several open cuts have exposed tin-bearing faces on pegmatites on the adjacent Centaur claim on the north side of Bear Gulch. Most of this pegmatite averages about 5 pounds of tin to the ton, although rich pockets are reported to carry up to 25 pounds per ton.

There is no recorded production from any of the dikes on this group.

Ref.: 24, p. 64; 60, pp. 628-630.

A-115, Winner Mining Co., Gold, Silver, Tin,
Tinton District, Lawrence County

The Winner Mining Co. was incorporated in South Dakota in June 1934 to take over the holdings of the old Abundance Mining Co. in extreme western Lawrence County. The company holds a group of 16 unpatented claims located on the divide between Beaver and Bear Creeks in the NW1/4 sec. 17, T. 5 N., R. 1 E., about 2-1/2 miles northeast of Tinton.

Extensive prospecting has been done in shear zones in the pre-Cambrian schists. About 4,000 feet of exploratory tunnels, shafts, and cuts is reported. The deepest shaft is 200 feet; the longest drift about 400 feet in length.

No lode production has been recorded, but some stream tin has been produced from the property.

Ref.: 1, p. 21; 13, p. 29; 36, pp. 116-117.

A-118, LOR Mining Co., Iron,
Lead District, Lawrence County

A deposit of hematite occurs on the AMH No. 1 claim, in the NE1/4NE1/4 sec. 13, T. 4 N., R. 3 E., near the crest of Strawberry Hill, 5 miles southeast of Lead. The ore consists of pebbles of hematite and quartz in a matrix, which is dominantly hematite, and forms the basal conglomerate of the Deadwood formation. It lies on an irregular surface of intensely folded pre-Cambrian schist and is overlain by strata of sandstone, dolomite, and shale, which are essentially horizontal.

Production began in 1948, when the LOR Mining Co. of Minneapolis began mining the hematite for pigment and for use in portland cement. The pigment was shipped to St. Louis, and the remainder to the State Cement Plant at Rapid City, S. Dak.

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Production was apparently confined to 1948, when 4,000 tons were shipped for pigment and 2 carloads were sent to the State Cement Plant for use in manufacture of their type 2 cement.

A-119, Hoffman Iron Deposit, Iron,
Lead District, Lawrence County

J. L. Hoffman and associates, as the Strawberry Hill Mining Co., hold about 310 acres on Strawberry Hill as an iron prospect. The property lies in sec. 13, T. 4 N., R. 3 E. and in adjacent parts of sec. 18, T. 4 N., R. 4 E.

The ore occurs in the basal conglomerate of the Deadwood formation. Pebbles of hematite and quartz are imbedded in a matrix, which is dominantly hematite. The deposit is 2 to 11 feet in thickness and is essentially horizontal. Overburden consists of strata of sandstone, quartzite, and shale of the Deadwood formation.

Mining was begun October 19, 1948, on the Sunset No. 5 claim in sec. 18, by the Curran and Fraser Development Co. of Lead, S. Dak. An open pit 300 by 30 by 20 feet was developed. It extends in a northwest direction parallel to the outcrop of the ore. Diamond-drill holes up to 200 feet beyond the face show that the ore continues, but under considerable overburden. In 1948 the operators mined 5,700 tons.

A manganese prospect on this property consists of veins of MnO_2 in closely spaced fractures in the lower part of the Deadwood sandstone and quartzite. Hand-sorted material is reported to run between 35 and 52 percent manganese. There has been no commercial production.

A-120, Etta, Gold, Tungsten, Lead District,
Lawrence County

The Etta gold and tungsten claim, located in the center of sec. 4, T. 4 N., R. 3 E., lies on the divide between Whitewood and Yellow Creeks. It is owned by the Homestake Mining Co.

Tungsten ore, in the form of wolframite, occurs as a replacement in the basal Deadwood quartzite in intimate association with the porphyry intrusions. The deposit is similar in all respects to the Wasp No. 2 and other tungsten properties 3/4 mile south on Yellow Creek. The ore also carries modest gold values associated with pyrite.

Ref.: 12, p. 204; 14, p. 26; 36, p. 100; 52, pp. 75-76.

A-121, Alder Creek Gold Mining Co., Gold, Silver,
Tungsten, Lead District, Lawrence County

The Alder Creek Co. was formed in 1901. The Little Blue fraction group of claims, consisting of about 40 acres in the NE1/4 sec. 9, T. 4 N., R. 3 E., was purchased, and a 60-ton cyanide mill was built to treat ores from the Little Blue and Pansy claims. The company operated on gold ores from the basal quartzite of the Deadwood formation until 1904. In 1911, the Bismarck Consolidated Mining Co. took over the property, rebuilt the mill in 1913, and produced gold and silver in 1913-14. The mill was operated under lease in 1918 and produced gold and a little tungsten from the Bismarck mines and from the Wasp No. 2.

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	Production			
	Gold, ounces	Silver, ounces	Tungsten, tons	Value
Alder Creek (1902-3).....	2500.00	68,006		
Bismarck (1911-14).....)	7316.20	6,116		
Bismarck and Wasp No. 2.....)			5.5	$3,832

Ref.: 1, p. 26; 14, p. 3; 33, pp. 211-212; 36, p. 95; 52, pp. 75, 93; 61, 1897-1918.

A-122, Wasp No. 2, Gold, Silver, Tungsten, Lead District, Lawrence County

The Wasp No. 2 group consists of about 130 acres of mineral claims located on Yellow Creek in the E1/2 sec. 9, T. 4 N., R. 3 E. It is now owned by the Homestake Mining Co.

The ore body was developed in the basal quartzite of the Deadwood formation, which was so well exposed by erosion that for several years all mining was done by open pit. The same ore zone carried wolframite and scheelite over an area of about 15 acres.

The Wasp No. 2 and adjacent claims were producing high-grade gold ore as early as 1894 under individual ownership, but the big production began after 1900, when the Wasp. No. 2 Gold Mining Co. assembled the claims and built a cyanide mill to treat the lower grade ores. The company operated continuously until early in 1917, when gold mining ceased, and the mill was torn down. Tungsten produced under lease in 1918 was milled in the nearby Bismarck (Alder Creek) mill.

Gold and silver production from the Wasp No. 2 has been valued at approximately $2,500,000 by Allsman, and the tungsten concentrates produced between 1915 and 1918 were valued at $267,443.

Ref.: 1, p. 40; 12, pp. 145-146; 14, pp. 3, 11, 15, 19, 29; 33, pp. 165, 211-212; 36, p. 116; 52, pp. 74-75.

A-123, Anaconda, Gold, Silver, Galena District, Lawrence County

The Anaconda Gold Mining & Milling Co. has held a large group of claims on the north side of Elk Creek, about 6 miles south of Lead. Claims held at the time of World War I were the Anaconda Nos. 1-34 and the Liberty Nos. 1-24, centering in secs. 25 and 26, T. 4 N., R. 3 E.

Early history is very incomplete. A reorganization was effected in 1902, and work was continued on 2 shafts in 1904-5. One shaft is reported to have reached a depth of at least 215 feet, with some crosscutting on the 200-foot level. Between 1928 and 1937, assessment work consisted of development in the Liberty tunnel.

The ore occurs as gold-quartz veins cutting the Algonkian schist, and mineralization is reported to be very similar to that at the Cloverleaf mine to the east. No production is recorded from the Anaconda property.

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From 1934 to 1937, the Anaconda Co. leased and operated the Cloverleaf or Uncle Sam mine at Roubaix 1-1/2 miles east of their own holdings. The operation was not successful and the mine was allowed to fill with water.

Ref.: 12, p. 114.

A-125, American Express, Gold, Silver
Lead District, Lawrence County

The American Express group consists of 11 claims located in Blacktail Gulch in the center of sec. 20, T. 5 N., R. 3 E. This group formed the original nucleus of the extensive holdings acquired by the old Imperial Gold Mining Co. and subsequently was taken over by the Ofer Co. in 1915.

Ore was developed at the lower contact zone of the Deadwood formation, just above the basal quartzite but below a persistent rhyolite sill. Mineralization followed a group of vertical fractures trending northeast. Development was by means of a drift extending north from the bed of Sheeptail Gulch. All of the ore mined was of the blue, unoxidized variety. The property was operated under lease as late as 1916.

Ref.: 2, p. 133; 33, pp. 210-211; 61, 1893, 1898, 1915, 1916.

A-125, Imperial, Gold, Silver,
Lead District, Lawrence County

The Imperial Gold Mining and Milling Co. was originally organized to operate the American Express group of claims in Blacktail Gulch. In 1902 the company began operating a 200-ton cyanide mill at Deadwood.. In 1904 Imperial bought several groups of productive claims in the Bald Mountain area, including the Apex, Monday group, Rudolph, Costello, and Dolphin group, Baltimore and Chance, Costello fraction, and Winneshiek (Greenough) group. Other holdings of the company were located on Beaver Creek.

Milling operations ceased shortly after 1908, but small-scale mining and development work was continued until at least 1912. Holdings of the Imperial Co. were taken over by the Ofer Co. in 1915.

Ref.: 2, pp. 132-133; 61, 1902, 1908, 1911, 1912.

A-126, Canyon Corp., Gold, Silver,
Lead District, Lawrence County

The Canyon Corp. operated the old Penobscot property at Maitland from 1934 to 1942.

In 1902 the Penobscot Gold Mining Co. assembled a block of about 1,100 acres of mining claims centering in secs. 7 and 18, T. 5 N., R. 3 E. Development at that time consisted of the Penobscot mine of R. M. Maloney in the SE1/4 sec. 18 and the Realization mine of May and Johnson in the center of the same section. This group was operated as the Alexander Maitland Co. from 1904 to 1906 and as the North Homestake Co. from 1907 to 1911. All of these operators confined their activities to production of gold ore from the lower contact of the Deadwood formation. From 1912 to 1915 other interests sank a shaft 600 feet into the pre-Cambrian schists and did extensive but unsuccessful exploration work to that depth. The Canyon Corp. reopened the mine in 1934 and operated on Cambrian ores by roasting and cyaniding until

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shut down in 1942 by WPB order L-208. The mine has not been unwatered since the order was lifted.

Production from 1902 to 1937 is given by Allsman as 309,005 tons of ore, from which 91,617.42 oz. gold and 76,248.87 oz. silver were recovered.

Ref.: 1, pp. 41-47; 2, p. 173; 33, p. 209; 36, p. 97; 58, pp. 188-191; 61, 1902.

A-127, Carroll (M.S. 1439), Gold, Silver,
Lead District, Lawrence County

The Carroll group consists of 12 claims located in Blacktail Gulch in adjacent parts of secs. 19 and 20, T. 5 N., R. 3 E. The property was an active producer of gold and silver ores in the 1890's. It was part of the holdings of the Beltram Gold Mining Co. in 1904 and has been included in several reorganizations and consolidations since that time.

The ore was developed in the dolomite immediately overlying the basal quartzite of the Deadwood formation and was localized as narrow shoots following a series of northeast-trending, vertical fractures. Mining was by irregular drifts following the verticals.

A production of $50,000 in gold and silver was reported from the Carroll group in 1897.

Ref.: 2, p. 171; 33, p. 118; 61, 1892, 1897.

A-128, Deadbroke Mine, Gold, Silver,
Lead District, Lawrence County

The Deadbroke mine is located in the NW1/4SW1/4 sec. 21, T 5 N., R. 3 E., on the north side of Blacktail Gulch. It is on the Deadbroke claim, one of a group variously known as the Deadbroke or Phoenix group. It was owned for many years by the Phoenix Gold Mining Co.

The mine is developed in the cement ore at the base of the Deadwood formation. The conglomerate ranges from less than 2 feet thick at the outcrop to about 22 feet at the north end of the mine. Much of the pyrite cementing material in the conglomerate has been oxidized to limonite.

The mine is entered by a drift and incline totaling 198 feet in length. The ore body was developed by extensive drifting, crosscutting, and stoping from the end of the incline. One stope is reported to have been 480 feet long, 50 feet wide, and 8 feet high.

The property was an intermittent gold producer until 1905. Allsman considers that the area probably affords better opportunities for finding additional ore than any other conglomerate area.

Ref.: 1, p. 23; 33, pp. 106-107; 36, p. 98; 61, 1897, p. 19, 1899, pp. 11, 18.

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A-129, Echo, Fluorite, Lead District, Lawrence County

The Echo group is located in the northwest corner of sec. 19, T. 5 N., R. 3 E. and in the northeast corner of sec. 24 in the adjacent township. It lies on the south side of Falsebottom Creek a short distance above Maitland.

The Echo Mining Co. was organized in 1902, and exploratory and development work continued intermittently until at least 1920. Country rock consists of pre-Cambrian schists cut by Tertiary porphyries. Several veins of fluorite were encountered during development.

The most recent work has been done by the Golden Mining Co., organized in South Dakota in 1928. Total development to date on the property consists of two shafts, 420 and 200 feet deep, and about 1,400 feet of crosscutting at the 200- and 400-foot levels.

No production has been recorded from the Echo property.

Ref.: 1, p. 66; 2, p. 171.

A-130, Garden City, Gold, Silver, Lead District, Lawrence County

The Garden City Mining Co. was the pioneer operator in the vicinity of Maitland in the old Garden City area. They held a group of claims in the W1/2 sec. 18, T. 5 N., R. 3 E. on the west side of Falsebottom Creek. These yielded the so-called blue siliceous ore from the basal contact of the Deadwood formation. In the early 1890's the Garden City Mining Co. built a small chlorination plant to treat these ores, but recovery was not satisfactory, and the operation was discontinued.

The property was taken over by the newly formed Minnesota Mining Co. in 1903 and operated until 1912. Production records for the Garden City Co. are incomplete and probably include ore taken in for custom milling. Statistics for later years are given under heading of the Minnesota Mining Co.

Ref.: 61, 1891, 1892, 1894.

A-130, Minnesota, Gold, Silver, Lead District, Lawrence County

The Minnesota group consists of 12 claims totaling about 150 acres in the W1/2 sec. 18, T. 5 N., R. 3 E. in the old Garden area. In 1903 the newly organized Minnesota Mining Co. took over the property of the Garden City Gold Mining Co. and acquired the adjacent Big Red and Dauntless claims.

Ore on this property was formed by replacement of the dolomite immediately overlying the basal quartzite of the Deadwood formation. Mineralization was controlled by a series of irregularly spaced, northeast-trending, vertical fractures. Efforts to develop ore in the underlying schists were not successful.

The Minnesota Mining Co. ceased production in 1910 but continued with exploratory work through 1912. Production for 1907-8 and 1910 is reported as 17,800 tons, carrying gold and silver valued at $59,355.00.

Ref.: 1, p. 24; 2, p. 169; 36, p. 95; 61, 1907-12.

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A-132, Kicking Horse (M.S. 1268), Gold, Silver, Lead District, Lawrence County

The Kicking Horse group is located near the head of Blacktail Gulch in the N1/2 sec. 20, T. 5 N., R. 3 E. It consists of 6 claims totaling about 44 acres. In 1937 it was owned by Christian Godfrey of Central City, S. Dak.

Ore is developed above the basal quartzite of the Deadwood formation along a series of northeast-trending, vertical fractures. Development was by a 160-foot shaft, from which a northwest drift was driven. Crosscuts were developed in the separate ore shoots cut by the drift.

The property is estimated by Lincoln to have produced about $100,000 in gold and silver before its shutdown in 1916.

Ref.: 33, p. 210; 36, p. 109; 61, 1897, 1898, 1899.

A-133, Wells Fargo (M.S. 946), Gold, Silver, Lead District, Lawrence County

The Wells Fargo group consists of 3 full claims and 1 fraction lying on the south side of Blacktail Gulch in the NW1/4 sec. 20, T. 5 N., R. 3 E. It was owned and operated in its later productive years by the Golden Reward Consolidated Gold Mining & Milling Co.

Ore was developed in the dolomite immediately overlying the basal quartzite of the Deadwood formation. Mineralization was controlled by a series of northeast trending vertical fractures cutting the dolomite but not continuing into the overlying shale. Replacement did not extend far into the dolomite, so that the resultant ore bodies were characteristically narrow.

Operations on this property were begun before 1892 and continued intermittently through 1916. Production figures are not available.

Ref.: 33, p. 210; 61, 1892, 1893.

A-134, Elliptic Mining Co., Lead District, Lawrence County

The Elliptic Mining Co. was organized before 1900, reorganized in 1903, and continued development work until at least 1907. It held a block of about 1,200 acres between Tetro and Miller Creeks in secs. 4, 5, 8, and 9, T. 5 N., R. 3 E.

A shaft sunk on the Eagle No. 4 claim reached a depth of 630 feet, including a 27-foot sump below the basal quartzite. It began in Tertiary clay and gravel and then penetrated alternate strata of porphyry and Deadwood formation. No record is available as to exploratory drifting and no production has been recorded.

A-138, Bismark (Globe), Gold, Lead District, Lawrence County

The Bismark group of claims is located southwest of Lead in the N1/2 sec. 5, T. 4 N., R. 3 E. and extends northward into secs. 31 and 32 of the township to the north. The group was one of several gold properties acquired by the Globe Gold Mining Co. at the time of its organization in 1901.

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Mineralization along fissures in the pre-Cambrian schists was explored by two drifts. An upper tunnel was 550 feet long, and 1 somewhat lower on the hillside extended for 200 feet. A shaft was begun on the Globe fraction claim in 1902 and ultimately reached a depth of at least 500 feet. Extensive cross drifting from the 500-foot level was carried out in hope of encountering the same mineralized zones at that depth.

No production has been recorded.

Ref.: 2, pp. 146-147; 61, 1902, p. 19.

A-139, Columbus, Gold, Silver,
Lead District, Lawrence County

The original Columbus (Sir Roderick Dhu) mine was located in Sawmill Gulch, a tributary to Deadwood Gulch, in the NE1/4 sec. 29, T. 5 N., R. 3 E. In 1902 the Columbus Consolidated Gold Mining Co. took control of 645 acres north of Deadwood Creek, including the Columbus mine and the 10-stamp mill of Ruth and Lardner. They also bought a 20-stamp and cyanide mill built at Gayville (Blacktail) by the old Baltimore and Deadwood Co., which had been under lease to the Portland Mining Co. The company operated the mill on Deadwood ores from the Rossiter, Dalton, and L & F claims while deepening and enlarging the old Columbus shaft to a 3-compartment, 500-foot shaft. The mill operation ceased in 1904, but extensive development from the bottom of the shaft was made in a search for a supposed continuation of the Homestake ore body. This exploration was apparently unsuccessful, and the entire operation was suspended early in 1906.

Holdings of the Columbus Co. were taken over by the Homestake Mining Co. about 1912.

Ref.: 2, pp. 138-139; 61, 1891-98, 1902-6.

A-140, Deadwood-Terra, Gold, Silver,
Lead District, Lawrence County

The Deadwood-Terra mine, a consolidation of the original Deadwood and Golden Terra mines, is located in the W1/2 sec. 28, T. 5 N., R. 3 E. on the divide between Deadwood and Bobtail gulches. It was operated by the Deadwood-Terra Gold Mining Co. before it passed into the hands of the Homestake Mining Co. about the turn of the century.

The property started out as a "cement ore" mine developed in the basal conglomerate of the Deadwood formation. However, the presence of gold-bearing strata (Homestake formation) in the steeply folded pre-Cambrian rocks soon led to deeper mining, and by 1900 the principal shaft had reached a depth of 900 feet.

The cement ores were reportedly very rich; the deeper ore carried much lower values. In 1897, the property produced 201,600 tons of pre-Cambrian ore valued at $348,700. No complete production figures are available.

Ref.: 1, p. 22; 33, p. 207, pl. II; 47, p. 19; 61, 1897, p. 17.

A-141, Durango Mine, Gold, Silver, Tungsten,
Lead District, Lawrence County

The Durango mine, one of the early mines in the Lead region, was located in the E1/2NE1/4 sec. 32, T. 5 N., R. 3 E. on the north side of Gold Run. It operated

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independently for many years but was consolidated with the Hidden Fortune Co. about the turn of the century. The Homestake Mining Co. acquired the latter in 1912.

The property is reported by Irving to have contained three types of ore. The first and most important was developed in the basal conglomerate of the Deadwood formation. On this property, the cementing material is thoroughly oxidized, and the thickness of the conglomerate ranges up to 15 feet. Above the basal quartzite, in the dolomite bed, which forms the so-called lower contact ore zone in the Northern Black Hills, 8 inches to 2 feet of refractory siliceous ore was present. This lay in the form of broad shoots following vertical fractures. It contained considerable crystalline barite and carried $25 to $60 per ton in gold. Locally the barite zone graded into wolframite carrying low gold values.

This property operated as a gold mine for nearly 30 years and also produced some tungsten between the years 1899 and 1901.

Ref.: 14, p. 15; 33, p. 208; 61, 1899.

A-141, Harrison Mine, Gold, Tungsten,
Lead District, Lawrence County

The Harrison gold and tungsten property is located at the top of the hill north of Lead, in the E1/2NE1/4 sec. 32, T. 5 N., R. 3 E. It was operated independently from the late 1870's until the turn of the century, when it became part of the Hidden Fortune group, and was ultimately taken over by the Homestake Mining Co.

As in the adjacent Durango mine, three types of ore were present. First to be exploited was the auriferous basal conglomerate of the Deadwood formation, which lay in a narrow channel in the old pre-Cambrian surface, but reached a thickness of 15 feet. Above the basal quartzite, replacement of a sandy dolomite produced a blanket of refractory siliceous gold ore up to 3 feet thick. Much crystallized barite is associated with this ore. Wolframite occurs surrounding, and somewhat disseminated, through the refractory ore.

This mine produced gold for many years, but complete data are not available. Tungsten was also produced between 1899 and 1901.

Ref.: 14, p. 15; 33, p. 207; 36, p. 104; 61, 1899.

A-141, Hidden Fortune Gold Mining Co., Gold, Silver, Tungsten,
Lead District, Lawrence County

The Hidden Fortune Gold Mining Co. was formed about 1900 by consolidation of a group of gold-tungsten properties lying northwest of Lead, in the NW1/4 sec. 32, and the S1/2 sec. 29, T. 5 N., R. 3 E. The 284 acres thus acquired included such early producers as the Sula, Harrison, Durango, Grant Reddy, Golden Crown claims, St. Patrick claim, Iowa, Brunnett, Swamp Eagle, Spokane, and Bingham mines. The entire property was bought by the Homestake Mining Co. in 1912, and several of the old claims were operated as tungsten mines from 1915 to 1919 and from 1927 to 1929.

Production was from the siliceous ore bodies of the Deadwood and from extensive exploratory workings in the pre-Cambrian schists. Operation of their mines and the mill at Deadwood continued through 1905, when they were shut down because of legal difficulties.

Gold production of the Hidden Fortune Co. for 1904 amounted to $108,000 and in 1905, $80,724.24.

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Ref.: 2, pp. 23, 143; 14, pp. 2, 15, 27; 17, p. 28; 33, p. 208; 36, p. 41; 52, pp. 70-74; 61, 1902-6.

A-142, Esmeralda (M.S. 1478), Baltimore and Deadwood,
Hidden Treasure (M.S. 48), Gold, Silver,
Lead District, Lawrence County

These three early day gold producers were located near the corner common to secs. 20, 21, 28, and 29, T. 5 N., R. 3 E., just north of Central City. They were developed in the so-called cement ore or basal Deadwood conglomerate in an outlier of the Deadwood formation lying on the divide between Blacktail and Deadwood Gulches. The ore is reported by Irving to have been particularly rich.

The properties were operated intermittently up until about 1900. The Baltimore and Deadwood built a small mill at the mouth of Blacktail Gulch, later leased it to the Portland Mining Co., and finally sold it to the Columbus Consolidated Mining Co. in 1902.

Only fragmentary production figures are available.

Ref.: 1, p. 22; 33, pp. 106, 181; 36, p. 100; 61, 1891, 1898.

A-143, Gentle Annie, Gold, Silver,
Lead District, Lawrence County

The Gentle Annie mine lies northeast of Lead in the SE1/4 sec. 28, T. 5 N., R. 3 E. The property is now owned by the Homestake Mining Co.

The mine was developed in the basal conglomerate of the Deadwood formation, which consists of a matrix of quartzite and schist pebbles cemented by pyrite. On this property a Tertiary sill has been intruded between the conglomerate and the underlying schists, except near the southern end of the property. Good gold values were apparently confined to the 2 to 6 feet of conglomerate just above the porphyry.

Mine workings were reached by a tunnel extending southwest from the next gulch east of Bobtail Gulch. Stopes were low but fairly extensive.

The only production figures available are for 1892 when 30 tons of ore assaying $11.00 was produced. The large production of the mine is believed to have been before that date.

Ref.: 33, p. 106, 183.

A-143, Monitor Mine, Gold, Silver,
Lead District, Lawrence County

The Monitor gold mine was located at the head of Bobtail Gulch, about 1 mile northeast of Lead near the C S1/2 sec. 28, T. 5 N., R. 3 E. The property was an early-day operator and was acquired by the Homestake around the turn of the century.

The ore was of the so-called cement type, in which the basal conglomerate of the Deadwood formation was cemented by pyrite, which was locally altered to iron oxides. The conglomerate occurs as an irregular blanket overlying the old pre-Cambrian erosion surface. Early workers considered the deposit to be a fossil conglomerate, though currently most of the gold is believed to have been introduced at the time of the intrusions of Tertiary porphyry.

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According to Irving, the mine was developed by a tunnel beginning in schist but extending southeast into the ore body. Stopes as much as 100 feet wide and 20 feet high are reported.

No production figures are available.

Ref.: 33, p. 182.

A-144, Gladiator (Cutting), Gold, Silver
Lead District, Lawrence County

The original Gladiator group, consisting of nine claims, lies astride the corner common to secs. 29, 30, 31, and 32, T. 5 N., R. 3 E. An adjacent block of 10 claims to the east was subsequently added. The property was operated as the Gladiator from about 1900 to 1916; as the Cutting from 1916 to 1925; and more recently as the National Gold Mining Co.

Ore was developed along a brecciated fault zone trending N. 75° E. through a mass of porphyry. Intense silicification of the fault-breccia preceded introduction of such ore minerals as pyrite, tetrahedrite, and calaverite.

Early workings consisted of shallow drifting, but a 500-foot shaft was sunk from 1918 to 1921 on the Winnie F. claim. Levels at 200, 350, and 500 feet were driven along the strike of the mineralized zone for 2,600 feet. An older drift, extending S. 10° W., follows a minor vein on the Kangaroo claim.

A 50-ton oil-flotation mill operated for a few months in 1925, but the entire operation shut down in November of that year. Some concentrates were shipped to the smelter, but the value is not known.

Ref.: 1, pp. 64-66; 2, p. 161; 12, pp. 173-175; 36, p. 112; 61, 1918-25.

A-145, Glover, Gold, Silver, Lead District,
Lawrence County

A group of 7 claims lying north of Nevada Gulch were held by the Glover Gold Mining Co. in the early 1900's. The group lies along the northwest edge of sec. 5 and in the adjacent part of sec. 6, T. 4 N., R. 3 E.

Mineralization along some north-south fractures in the pre-Cambrian schists and quartzites led to the sinking of an exploratory shaft on the Saratoga claim. This reached a depth of at least 370 feet by the end of 1902. Apparently no commercial ore body was encountered, although high values were reported as the shaft was sunk.

No production has been reported from the property.

Ref.: 61, 1902, p. 20.

A-146, Hawkeye-Pluma, Gold, Silver,
Lead District, Lawrence County

The Hawkeye and Pluma gold mines were located south of the Gentle Annie in the SE1/4 sec. 28, T. 5 N., R. 3 E. The Pluma Gold Mining Co. bought out the Hawkeye mine and the mill at Pluma in 1902 and acquired other claims just east of the Homestake mine. All of these holdings are now owned by the Homestake Mining Co.

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Ore was developed in a basal Deadwood conglomerate, which fills a channel in the old pre-Cambrian surface. The conglomerate is cemented with pyrite, which weathers to iron oxide. Locally this channel filling approaches 40 feet in thickness, whereas the basal conglomerate is normally 6 to 12 feet thick in this area. Gold values were confined to the bottom few feet.

The channel extended in a general north-south direction parallel to the outcrop and about 200 feet in from it. Development was by stoping from four drifts driven west from points along the hillside, coming in under the ore body. One shaft extended from the surface to intersect the ore. Samples of old pillars, reported by Irving, indicate that the ore ran $10 to $12 at the old base price for gold.

Ref.: 2, pp. 164-165; 33, pp. 106, 183, pl. XVIII; 61, 1899, 1902.

A-147, Hidden Treasure Group (M.S. 1739), Gold, Silver,
Lead District, Lawrence County

The Hidden Treasure group, consisting of 194 acres of patented claims, lies in secs. 30 and 31, T. 5 N., R. 3 E., and in adjacent parts of secs. 25 and 36, T. 5 N., R. 2 E. It was operated in the early days by the Hidden Fortune Gold Mining & Milling Co. but was taken over in the 1930's by the Hoosier Mining & Milling Co.

The first quartz mill brought to the Black Hills was set up on this property in 1876 to produce gold from the basal conglomerate of the Deadwood formation. The ore, formerly believed to be a fossil placer, ranged from 2 to 12 feet in thickness. Later development extended down into the underlying pre-Cambrian schists and was associated with intrusions of Tertiary porphyry. Small veins of fluorite, ranging from 1/4 inch to 16 inches in width, were encountered during early mining operations and received some further exploratory work during World War II.

Numerous short drifts are to be found on the property, and 1 shaft is reported by Lincoln to be 280 feet deep.

Ref.: 1, p. 22; 2, p. 151; 33, p. 106; 36, pp. 105, 108.

A-148, Jupiter, Gold, Silver,
Lead District, Lawrence County

A small group of claims known as the Gustin and Redemption group was assembled by the Jupiter Gold Mining & Milling Co. about 1902. These are located in Blacktail Gulch, in the SW1/4 sec. 21, T. 5 N., R. 3 E., 1/2 mile north of Central City.

To treat their ore, which was the so-called cement ore of the basal conglomerate of the Deadwood formation, they leased a stamp mill built on the adjacent Minerva claim by the Boston-South Dakota Mining Co. and added a 100-ton cyaniding plant annex.

The company produced $15,000 in gold in 1903, but the mill was shut down, and no further production is recorded.

Ref.: 2, p. 172; 61, 1902, 1903.

A-149, Minerva (M.S. 1030), Gold, Silver,
Lead District, Lawrence County

The Minerva gold mine is located in the NW1/4SW1/4 sec. 21, T. 5 N., R. 3 E. on the north side of Blacktail Gulch 2 miles north of Lead.

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The mine was developed in the so-called cement ore of the basal conglomerate of the Deadwood formation. The thickness of the conglomerate varies from less than 2 feet along the outcrop to about 22 feet in the northern end of the mine workings. The original pyrite cementing material in the conglomerate is much less oxidized in this property than in the Deadbroke mine 500 feet to the west.

The mine was entered by a tunnel extending northward from the hillside.

The property was a minor gold producer in the early days. In 1893 a 20-stamp mill on the property treated 5,143 tons of ore valued at $16,000. This mill was subsequently leased, about 1903, to the Jupiter Gold Mining & Milling Co., which operated the adjacent Gustin and Redemption group of claims. It was finally moved to the Custer Peak Copper Co. holdings near Roubaix in 1917.

Ref.: 1, p. 22; 33, p. 106; 61, 1893, p. 19.

A-150, Omega Mine, Gold, Silver,
Lead District, Lawrence County

The Omega mine, one of the first to produce gold from the Cambrian conglomerate, is located in the west central part of sec. 28, T. 5 N., R. 3 E. A 10-stamp mill was erected on the property by Milton E. Pinney in December 1876. The claim is now owned by the Homestake Mining Co., but the mine has been idle for many years.

The ore, which occurred in the basal conglomerate of the Deadwood formation, ranged up to 12 feet in thickness and was overlain by a series of weak, friable sandstones. The cementing material in the conglomerate was originally pyrite but in the Omega it was largely altered to iron oxides.

Development was by a drift in the pre-Cambrian schist, the ore being mined through raises extending up into the ore-bearing zone.

Ref.: 1, p. 22; 33, pp. 106, 182; 61, 1899.

A-150, Pinney, Gold, Silver, Lead District,
Lawrence County

The Pinney mine was one of 3 early day mines operating on the divide between Deadwood and Bobtail Gulches in the W1/2 sec. 28, T. 5 N., R. 3 E. The property is now held by the Homestake Mining Co.

The ore occurred as cementing material in the basal conglomerate of the Deadwood formation immediately overlying the steeply folded pre-Cambrian schists. The original ore mineral was gold-bearing pyrite, but on this property the cement was entirely altered to iron oxides. Irving states that both the regular ore and broken ledge material in the conglomerate carried very high gold values.

The property was developed by opencut methods. Complete history and production data are not available.

Ref.: 33, p. 182.

A-151, Oro Hondo, Gold, Silver,
Lead District, Lawrence County

The Oro Hondo Mining Co. was organized in 1902 and acquired about 1,100 acres of mineral land adjacent to the Homestake on the southeast. Holdings centered in

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sec. 3, T. 4 N., R. 3 E. but extended into all adjacent sections. The purpose of the company was to sink a shaft deep enough to encounter the Homestake ore body. A shaft was begun on the Comstock No. 2 claim in 1902 and sunk to a depth of about 1,000 feet by 1914. It was taken over in 1915 by John T. Millikan of Colorado, who deepened it to 2,200 feet and did extensive diamond drilling before 1917. It was later taken over by the Homestake Mining Co., who deepened the shaft and put it into service as a ventilating shaft.

Ref.: 2, pp. 162-163; 61, 1902, 1914-17.

A-152, Pennsylvania (M.S.1685), Gold, Silver,
Lead District, Lawrence County

The Pennsylvania group lies south of Deadwood Creek in secs. 30 and 31, T. 5 N., R. 3 E. It consists of 18 patented claims totaling 245.6 acres.

Ore is developed in a northeast-southwest-trending shear zone in pre-Cambrian schist. It is believed to be an extension of the fracture system developed in the porphyry in the adjacent Gladiator (Cutting) mine to the east. Minerals are reported to include gold, pyrite, fluorite, and a telluride believed to be calaverite. Principal workings consist of a 160-foot shaft on the Golden Rule claim and about 870 feet of lateral drifting and raises.

The history of the property is imperfectly known, but ore shipments are reported as early as 1902. Total production was apparently small.

Ref.: 1, pp. 19-20; 2, p. 173; 36, p. 113; 61, 1902.

A-153, Homestake Mining Co., Gold, Silver,
Lead District, Lawrence County

The Homestake Mining Co. was formed in 1877, when George Hearst acquired the Homestake and Golden Star claims in the NW1/4 sec. 33, T. 5 N., R. 3 E. within the present town of Lead. By 1901 it had absorbed adjacent mines along the same ore body, including the Father DeSmet, Deadwood-Golden Terra, Highland, and Caledonia. Subsequent acquisitions have built their holdings to roughly 600 mining claims, in addition to extensive water rights and timber holdings in South Dakota and Wyoming.

The main gold ore body, consisting of irregular replacement in an intensely folded bed of cummingtonite schist, which plunges to the southeast at about 35°, has been followed to a depth of 5,000 feet. Through 1948 total production amounted to approximately 18,750,000 oz. gold. Claims held by the company near Lead and on Yellow Creek have produced over $1,000,000 in tungsten during 1899-1901, 1915-19, and 1926-29.

The company also owns and operates a large coal mine at Gillette, Wyo., and a sawmill at Spearfish, S. Dak.

Ref.: 1, pp. 11-13; 2, pp. 123-128; 11, pp. 21-54; 12, pp. 77-111; 33, pp. 55-92; 36, pp. 105-107; 47; 50; 67, pp. 135-138.

A-154, Frerichs Mining Co., Gold, Silver,
Lead District, Lawrence County

The Frerichs Mining Co. holds about 350 acres in Whistler Gulch, at the south edge of Deadwood. The claims are those formerly included in the H. H. Kiemer and Queen of the Hills properties and lie mostly in secs. 26 and 35, T. 5 N., R. 3 E.

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The most extensive work on this group was done in 1912-14, when the Kiemer Gold Mining & Milling Co. began an exploratory drift to intersect at depth some surface showings of highly mineralized porphyry. Workings, most of which lie on the Susa fractional claim, now consist of 2 open cuts, a 220-foot shaft, and drifting on the 30-, 93-, and 200-foot levels. The upper drift connects the two open cuts. The principal, or 93-foot, level is connected to the surface at the ground level of the mill, and now forms the main haulageway. Except for the 200-foot level, which has been allowed to flood, the mine and mill are maintained in standby condition, but operations have not been resumed since the war.

Most of the ore is developed in a brecciated zone lying at the contact between the schist country rock and a large porphyry intrusive of Tertiary age.

The present operator, D. A. Frerichs, took over the property in 1933 and operated the mine and mill intermittently from 1939 to 1941. Production of gold bullion during that interval was small. It is not known if there is any previous production from the property.

Ref.: 36, p. 101; 61, 1921, p. 13-14, 1939, pp. 16-17, 1940, p. 27, 1941, p. 26, 1946, pp. 7, 27, 1947, p. 28.

A-155, Slavonian (M.S. 1303), Pyrite,
Lead District, Lawrence County

The Slavonian (Glover) pyrite mine was situated on the south side of Gold Run at the east edge of Lead in the SW1/4NW1/4 sec. 34, T. 5 N., R. 3 E.

It is located on the same zone of black graphitic shale as the Montezuma and the Whizzers and the Olaf Seim mines on the west outskirts of Deadwood. This pyritic bed, which locally bears the name of the Iron Dike has been extensively prospected for copper because of the presence of a very small percentage of chalcopyrite. It may be followed in a zigzag course as far north as City Creek and as far southwest as Kirk.

Production apparently began in the early 1890's to supply pyrite to the smelter at Deadwood and continued at least through 1899. From 6 to 12 men were normally employed, according to annual reports from the superintendent, Antone Glover (Glaers in one report).

Ref.: 17, Lead Quadrangle map; 44, p. 16; 61, 1891, 1893, 1899.

A-156, Queen of the Hills, Gold, Silver,
Lead District, Lawrence County

The Queen of the Hills Gold Mining Co. assembled a block of 100 acres of patented ground in Whistler Gulch about 1904. It is located near the south edge of Deadwood in sec. 35, T. 5 N., R. 3 E., and now forms part of the holdings of the Frerichs Gold Mining Co.

Mineralization, similar to that at the old Kiemer mine of the Frerichs Co., occurs at the contacts between massive quartz veins, Tertiary intrusions, and pre-Cambrian schists.

History of the property is known only from frequent news items in the Black Hills Mining Review. Early in 1904, a drift was begun in the schist between a quartz vein and a porphyry dike. Perhaps 300 feet ahead of the portal, and at considerably higher elevation, a shaft was begun and ultimately reached a depth of 190 or more

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feet. Simultaneously, some nearby surface showings were developed by open pits and trenches. At this stage in the overall development of the property, a 20-stamp mill was begun near the adit in the spring of 1905. Apparently, before it was completed, financial and other difficulties overtook the company and operations ceased.

AREA B

Geology

This area lies in the north central part of the Black Hills. It comprises Tps. 1 to 3 N., Rs. 1 to 8 E. and includes the southern part of Lawrence and Meade Counties, and the north half of Pennington County west of the Rapid City Air Force Base, figure 4. Drainage is toward the east, by Elk, Box Elder, and Rapid Creeks. The entire area is covered by Folio 219 (Central Black Hills) of the Geological Atlas of the United States (17).

Pre-Cambrian Rocks

The pre-Cambrian rocks in the central Black Hills consist of several thousands of feet of metamorphosed sediments, with minor amounts of basic intrusive. They appear as a highly folded series of phyllites and schists, with inter-bedded quartzites and amphibolite. The folding has a general north-northwest trend. The pre-Cambrian rocks are overlain unconformably by nearly flat lying Deadwood sandstone.

Minerals within the pre-Cambrian rocks in the central part of the Black Hills include gold in a belt extending through Nahant, Rochford, Mystic, and Redfern; arsenical lead-silver ores near Silver City; and graphite and traces of copper in the graphitic schists northwest of Rochford. Quartzite from a quarry 11 miles west of Rapid City was formerly used for aggregate and as a filter stone.

Except for the gabbroic intrusives, which are now represented by bands of amphibolite, igneous rocks are rare in the area covered by this report. An outcrop of granite gneiss, presumably related to the Harney Peak granite, is exposed for several miles along the valley of Little Elk Creek. Custer Peak, which also lies near the north edge of the area, is the most southerly of the large Tertiary intrusives, which are so abundant in the northern Black Hills.

The detailed stratigraphy of the pre-Cambrian rocks has been worked out only in the vicinity of Rochford, where the sequence appears to be similar to that at Lead. Mineralization around Rochford occurs in the same carbonate schist as the ore body at the Homestake gold mine.

Bedded quartz-hematite deposits occur in mica and chlorite schists in the vicinity of Nemo and Benchmark. Originally prospected for gold, these now furnish hematite for the State Cement Plant at Rapid City.

Paleozoic Rocks

Cambrian System

Deadwood formation. - The Deadwood formation consists of 200 to 300 feet of reddish brown sandstone within the area covered by this report. The section is less dolomitic than to the north, and the upper dolomitic and shaly members have probably been removed by post-Ordovician, pre-Mississippian erosion. Mineralization, so widely distributed in the area to the north, is entirely missing in the Deadwood in this section.

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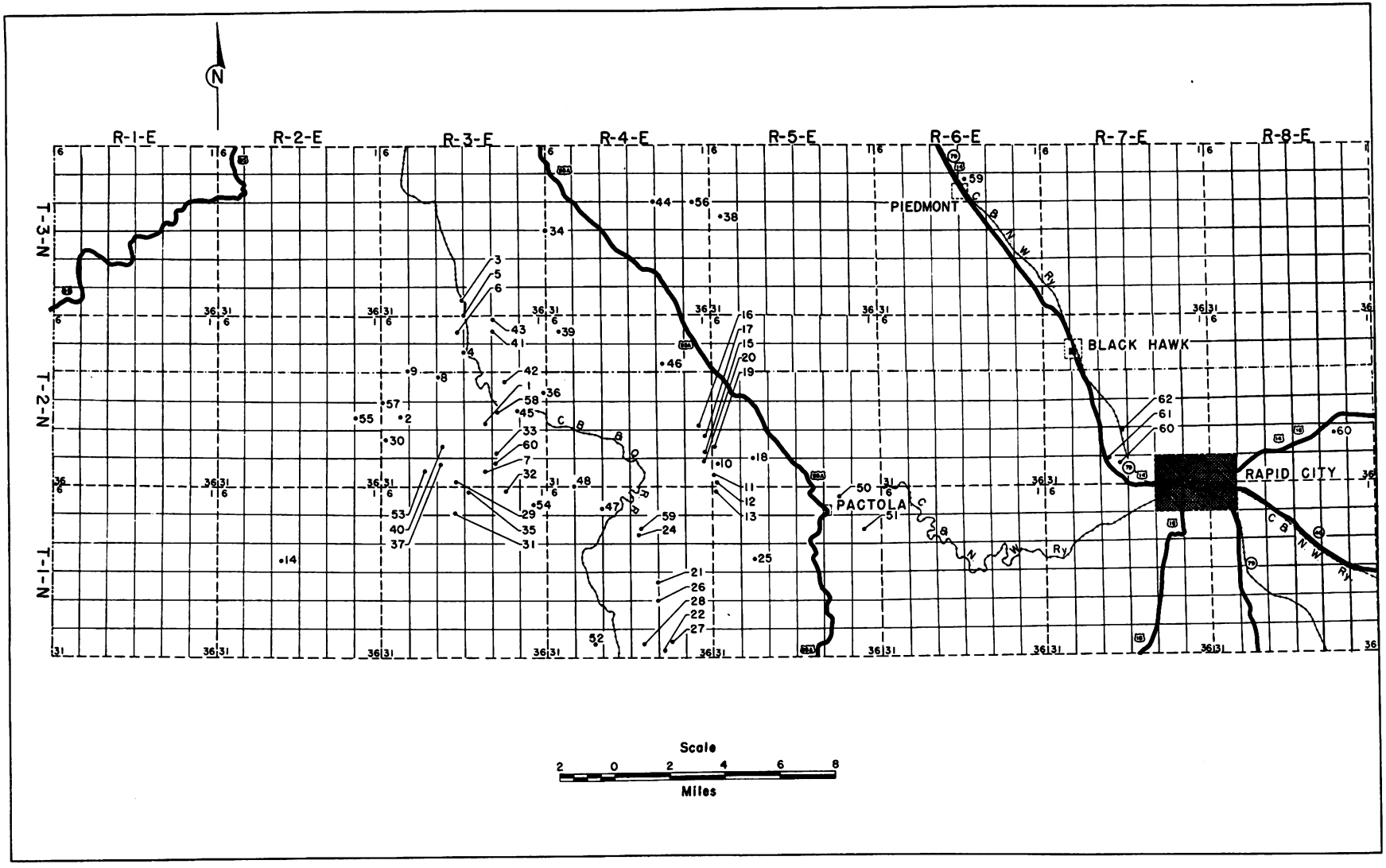

Figure 4. - Location map, area B.

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Ordovician System

The middle and upper Ordovician beds were removed from this area by pre-Mississippian erosion, except for a small outlier north of Nemo and Little Elk Creeks. Because the Ordovician beds are thin, they are usually hidden by a talus-covered bench at the foot of the cliff-forming Mississippian limestones.

Mississippian System

Lower Mississippian Englewood formation. - The Englewood consists of 30 to 50 feet of purplish limestone. It is very argillaceous in its lower part. Locally, it may grade down into lenses of oolitic hematite, which were formed on the old Deadwood erosion surface. No use has been made of the Englewood in this area.

Middle Mississippian Pahasapa limestone. - This cliff-forming, light-gray limestone reaches a thickness of 300 to 500 feet in this area. It is the equivalent of part of the Madison of the Rocky Mountain area.

The Pahasapa was quarried at Dumont for several years, primarily as a flux for the Deadwood smelters. At the Dark Canyon Quarry west of Rapid City it was formerly crushed for aggregate. Many parts of the formation are too dolomitic for use in portland cement. The Pahasapa carries an abundance of warm, fresh water. It is used in 1 well at Rapid City and 2 wells at the Rapid City Air Force Base. It is also probably the source of the large springs just west of Rapid City.

Several commercial caves have been opened in the Pahasapa in this area.

Pennsylvanian System

Minnelusa formation. - The Minnelusa formation consists of about 550 feet of sandstone, dolomite, and shale in outcrops in this vicinity. Anhydrite, not present on the outcrop, increases the thickness to 600 feet in subsurface. The Minnelusa is not used commercially in this area. Close to the outcrop the upper sands of the Minnelusa carry fresh artesian water. It is used by four city wells and by numerous private individuals near Rapid City and along the red valley through Black Hawk and Piedmont.

Permian System

Opeche formation. - The Opeche consists of 90 to 110 feet of brick-red shale, presumably of Permian age. Opeche shale is now used to furnish the clay ingredient in the cement manufactured at the State plant at Rapid City.

Minnekahta limestone. - The Minnekahta consists of 40 to 60 feet of thin-bedded, purplish limestone. It is extensively quarried near Rapid City for use as rip-rap aggregate, sand, and agricultural lime and is also the source of limestone for the State Cement Plant.

Triassic System

Spearfish formation. - The Spearfish consists of 350 feet or more of red shale and siltstone and is probably of Permian-Triassic age. Gypsum beds within the formation locally reach commercial thickness. At one time or another the Spearfish gypsum has been used in the manufacture of plaster at Rapid City, Black Hawk, and Piedmont. Small quantities are used as a retarder in the manufacture of cement at Rapid City. Weathered Spearfish clays were used in the manufacture of common brick at Rapid City shortly after 1900.

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Jurassic System

Nugget (?), Gypsum Springs, Sundance, Unkpapa, and Morrison formations. - This series reaches a thickness of 450 to 600 feet along the east flank of the Black Hills. A soft, weathered sand from the top of the Sundance has been extensively used near Rapid City as a subgrade beneath concrete pavement. Unkpapa sandstone was once quarried at Rapid City for a building stone.

Cretaceous System

Lakota sandstone. - The Lakota consists of up to 200 feet of sandstone, with minor beds of shale. In the early days, the Lakota was extensively quarried at Rapid City for building stone. It is an important aquifer east of the Black Hills.

Fuson shale. - The Fuson consists of up to 100 feet of shale, clay, and sandstone. A gray siliceous "fireclay" at Rapid City was used for fire brick about 1902.

Dakota sandstone. - The Dakota sandstone averages about 50 feet thick along the east side of the Black Hills. It has been used as a building stone and is an important aquifer east of the Black Hills. A 3-foot black carbonaceous shale bed near Rapid City has been mistaken for coal.

Graneros formation. - The Graneros, which reaches a total thickness of about 800 feet east of the Black Hills, can be sub-divided as follows:

	Feet
Belle Fourche shale member	300-400
Mowry siliceous shale member	150-200
Newcastle sandstone member	0-30
Skull Creek shale member	200-250

The Newcastle sandstone has been unsuccessfully prospected for oil along the east flank of the Black Hills. A few ranches have secured small supplies of artesian water from it. At one time it was quarried at Rapid City for building stone. The bentonite usually found at the top of the Mowry member is missing in this area.

Greenhorn limestone. - This 40- to 65-foot formation consists of slabby limestone and calcareous shale. It has been used by ranchers for building foundations, bridge abutments, and as rip-rap on stock dams.

Carlile formation. - The Carlile consists of up to 450 feet of dark-gray marine shale with large limestone concretions. Sandstones within the formation produce oil in Wyoming, but no shows have been encountered on the east side of the Black Hills.

Niobrara formation. - The Niobrara consists of about 200 feet of chalky shale. It has not been exploited in this area, though farther east it was formerly used as cement rock at Yankton and as a local building stone along the Missouri River.

Pierre formation. - On the east side of the Black Hills, the Pierre consists of up to 1,200 feet of dark-gray marine shale. The Ardmore bentonite in the basal Pierre extends into the southeast corner of this area but has not been developed. For about 20 years Pierre shale from a quarry east of Rapid City was used for the shale ingredient of portland cement. Farther east, along the Missouri River, iron-manganese nodules in the Pierre form a vast low-grade reserve of manganese.

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Fox Hills and Hell Creek formations. - These do not crop out east of the Black Hills but cover extensive areas in the northwestern part of the State.

Cenozoic Rocks

Fort Union Formation

This formation, which covers a large area in the northwestern corner of the State, does not crop out in the area under consideration. It contains beds of lignite up to 8 feet thick, which have supplied local demand.

Oligocene-White River Formation

The White River clays are best known to the southeast, where erosion has carved them into intricate badlands. Closer to the Black Hills, the formation becomes progressively coarser. High terrace gravels have supplied road metal locally, and on some of the larger terraces east of the Black Hills the gravels contain enough water to supply ranch wells. Beds of volcanic ash and fuller's earth have been examined but not utilized, and some local effort has been made to test the ceramic value of the clays.

Tertiary Intrusives

Except for Custer Peak, along the north edge of the area, there are no Tertiary intrusives within the area covered by this report.

Quaternary and Recent Rocks

Gravels of relatively recent origin occur in present stream valleys and in terraces at several levels above the present drainage. Gold, the only mineral recovered by placer mining within the area, has been found along Rapid Creek and its tributaries.

During recent time, bog iron has accumulated in several small stream valleys near Rochford. This has been mined in a small way for use as a paint pigment, and some has more recently been shipped to Rapid City for use by the State Cement Plant.

Mines and Mineral Deposits

Alphabetical index, Area B

Name	Commodity	Serial No.
Alexander Lode	Gold, silver, lead, antimony.	B-10
Ama Queen	Gold, silver.	B-56
Apex (Divide & Ridge Mercedes group)	do.	See B-53
Apex No. 4 (Divide & Ridge Mercedes group)	do.	See B-53
Apex No. 8 (Divide & Ridge Mercedes group)	do.	See B-53
Ashley & Nyswanger (Dexter claim)	Gold, silver, copper.	B-51
Barnes group (Black Tom)	Gold, silver.	See B-21
Basin Nos. 1 and 2 (Cuttysark, Blue Talc mine)	do.	See B-47
Bee (Black Hills Copper Co. M S. 1912-1913)	Copper, gold, silver.	See B-30
Benedict property (Golden West mine)	Gold, silver.	See B-35
Besse B group (Inca Fairview group)	do.	See B-48

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Name	Commodity	Serial No.
Black Eagle	Gold, silver.	B-29
Black Hills Copper Co	Copper, gold, silver.	B-30
Black Tom (Barnes group)	Gold, silver.	B-21
Blair group (Black Eagle mine)	do.	See B-29
Blakely Bog iron deposit	Iron,pigment.	B-1
Blue Bird (Minnesota Ridge Mining Co.)	Gold, silver.	See B-39
Blue Talc (Cuttysark mine)	do.	See B-47
Burlington lode	do.	B-22
Calabogia	Silver, lead.	B-46
Carbon King	Graphite.	B-31-32
Climax (Black Hills Copper Co. M.S. 1912-13)	Copper, gold, silver.	See B-30
Cochrane mine (Lookout property)	Gold, silver.	B-33
Copper Cliff Co	Graphite.	B-55
Copper Glance (Poisoned Ox Group)	Gold, copper, uranium.	See B-50
Copper Reef Nos. 1 and 2 (Black Hills Copper Co. M.S. 1912-1913)	Copper, gold, silver.	See B-30
Cottrill Bog iron deposit	Iron, pigment.	B-7
Custer Peak Copper Co	Copper.	B-34
Cuttysark (Blue Talc)	Gold, silver.	B-47
Dakota Lime and Brick Co	Limestone.	B-62
Dexter Claim (Ashley & Nyswanger prospect)	Copper, gold, silver.	See B-51
Dexter Lode (Yellow Bird)	Gold, silver.	See B-40
Diana group	do.	B-11
Divide and Ridge	do.	B-53
Doctor No. 2	do.	B-52
Double Star claim (Hausle Bog iron deposit)	Iron, pigment.	See B-8
Duggan's prospects	Gold, silver.	B-12-13
Duncan Kennedy property (Safe Investment mine)	do.	See B-44
Dungey Bog iron deposit	Iron, pigment.	B-9
Fairview (Inca group)	Gold, silver.	See B-48
Florence Lode (Doctor No. 2 group)	do.	See B-52
G & H group (Carbon King property)	Graphite.	See B-31
Gold Center (Doctor No. 2 group)	Gold, silver.	See B-52
Gold King (Gordelia mine)	do.	See B-36
Golden West	do.	B-35
Gopher Lode	Copper, gold, silver.	B-14
Gordelia (Gold King)	Gold, silver.	B-36
Gorman's Mine (Diana group) (Comstock)	do.	See B-11
Grand View Mining Co	Gold, silver, lead.	B-15
Hausle Bog iron deposit	Iron, pigment.	B-8
Hawk Wright (Sunbeam Payday group)	Gold, silver.	See B-27
Hidden Gem (Divide & Ridge Mercedes group)	do.	See B-53
Hills Materials Co	Limestone.	B-61
Homelode	Gold, silver, antimony, lead.	B-16
Huney property	Gold, silver.	B-17
Inca (Fairview group)	do.	B-48
Iron lode (Lessering Bog iron deposit)	Iron, pigment.	See B-2
Jenny Gulch mine	Gold, silver, copper.	B-18

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Name	Commodity	Serial No.
Jungle mine (Custer Peak Copper Co.)..	Copper.	See B-34
King of the West (North Star).....	Gold, silver.	B-37
Lessering Bog iron deposit.....	Iron, pigment.	B-2
Lookout.....	Gold, silver.	B-54
Lucky Strike.....	do.	B-38
Marigold Mining & Milling Co.....	do.	B-57
Mariposa mine.....	do.	B-24
Mary Belle.....	do.	B-58
Melchert Bog iron deposit.....	Iron, pigment.	B-5
Mercedes (Divide & Ridge Mercedes group).....	Gold, silver.	See B-53
Merry Posey (Mary Posey) (Mariposa mine).....	do.	See B-24
Midnight prospect.....	do.	B-19
Mineral group (Cochrane mine).....	do.	See B-33
Minnesota Ridge Mining Co.....	do.	B-39
Montana.....	do.	B-41
Montezuma.....	do.	B-42
Negro Gulch Bog iron deposit.....	Iron, pigment.	B-6
North Star (King of the West mine)....	Gold, silver.	See B-37
Omega group.....	do.	B-25
Oregon Nos. 1-29 (Safe Investment mine)	do.	See B-44
Payday (Sunbeam group).....	do.	See B-27
Poisoned Ox group (Copper Glance).....	Gold, copper.	B-50
Pyrite (Safe Investment mine).....	Gold, silver.	See B-44
Queen Bee.....	do.	B-26
Ray.....	do.	B-43
Red Jim (Montezuma mine).....	do.	See B-42
Red Squirrel (Minnesota Ridge Mining Co.).....	do.	See B-39
Safe Investment.....	do.	B-44
Slate Creek Lode (Mariposa mine).....	do.	See B-24
Solnar (Black Hills Copper Co. M.S. 1912-1913).....	Copper, gold, silver.	See B-30
South Dakota State cement plant.....	Limestone, shale.	B-60
Standby.....	Gold, silver.	B-45
Stevens Rockwell No. 4 (Inca Fairview group).....	do.	See B-48
Sunbeam (Payday).....	do.	B-27
Swilley Gulch Bog iron deposit.....	Iron, pigment.	B-4
Teddy, Teddy Nos. 1 and 2 (Cuttysark, Blue Talc mine).....	Gold, silver.	See B-47
Third Time Lode (Mariposa mine).....	do.	See B-24
Tilson Gulch Bog iron deposit.....	Iron, pigment.	B-3
Tom Gorman Property (Huney property)..	Gold, silver.	See B-17
U. S. Gypsum Co.....	Gypsum.	B-59
Woodchuck.....	Gold, silver.	B-28
Yellow Bird (Dexter lode).....	do.	B-40

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Numerical index

Serial No.	Name	Commodity
B-1	Blakely Bog iron deposit.....	Iron, pigment.
B-2	Lessering Bog iron deposit.....	Do.
B-3	Tilson Gulch Bog iron deposit.....	Do.
B-4	Swilley Gulch Bog iron deposit.....	Do.
B-5	Melcher Bog iron deposit.....	Do.
B-6	Negro Gulch Bog iron deposit.....	Do.
B-7	Cottrill Bog iron deposit.....	Do.
B-8	Hausle Bog iron deposit.....	Do.
B-9	Dungey Bog iron deposit.....	Do.
B-10	Alexander lode (M.S. 592).....	Gold, silver, antimony, lead.
B-11	Diana group (Comstock).....	Gold, silver.
B-12-13	Duggan's prospects.....	Do.
B-14	Gopher lode.....	Copper, gold, silver.
B-15	Grand View Mining Co. (M S. 1948).....	Lead, gold, silver.
B-16	Homelode.....	Gold, silver, antimony, lead.
B-17	Huney property.....	Gold, silver.
B-18	Jenny Gulch mine.....	Gold, silver, copper.
B-19	Midnight prospect.....	Gold, silver.
B-20	Undeveloped prospect.....	
B-21	Black Tom (Barnes group).....	Gold, silver.
B-22	Burlington lode.....	Do.
B-23	Undeveloped prospect.....	
B-24	Mariposa mine.....	Gold, silver.
B-25	Omega group.....	Do.
B-26	Queen Bee.....	Do.
B-27	Sunbeam (Payday).....	Do.
B-28	Woodchuck.....	Do.
B-29	Black Eagle.....	Do.
B-30	Black Hills Copper Co. (M.S. 1912-1913)..	Copper, gold, silver.
B-31-32	Carbon King.....	Graphite.
B-33	Cochrane mine.....	Gold, silver.
B-34	Custer Peak Copper Co.....	Copper.
B-35	Golden West.....	Gold, silver.
B-36	Gordelia (Gold King).....	Do.
B-37	King of the West (North Star).....	Do.
B-38	Lucky Strike.....	Do.
B-39	Minnesota Ridge Mining Co.....	Do.
B-40	Yellow Bird (Dexter Lode).....	Do.
B-41	Montana (M.S. 1697).....	Do.
B-42	Montezuma.....	Do.
B-43	Ray.....	Do.
B-44	Safe Investment.....	Do.
B-45	Standby.....	Do.
B-46	Calabogia.....	Silver, lead.
B-47	Cuttysark (Blue Talc).....	Gold, silver.
B-48	Inca (Fairview group).....	Do.
B-49	Undeveloped prospect.....	
B-50	Poisoned Ox group (Copper Glance).....	Gold, copper, uranium.
B-51	Ashley & Nyswanger (Dexter claim).....	Copper, gold, silver.
B-52	Doctor No. 2.....	Gold, silver.
B-53	Divide & Ridge (Mercedes).....	Do.
B-54	Lookout.....	Do.
B-55	Copper Cliff Co.....	Graphite.

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Serial No.	Name	Commodity
B-56	Ama Queen	Gold, silver.
B-57	Marigold Mining & Milling Co	Do.
B-58	Mary Belle	Do.
B-59	U. S. Gypsum Co	Gypsum.
B-60	South Dakota State cement plant	Limestone, shale.
B-61	Hills Materials Co	Limestone.
B-62	Dakota Lime and Brick Co	Do.

Commodity index

Gold

Name	Serial No.
Alexander lode	B-10
Ama Queen	B-56
Ashley & Nyswanger (Dexter claim)	B-51
Black Eagle	B-29
Black Hills Copper Co	B-30
Black Tom (Barnes group)	B-21
Burlington lode	B-22
Cochrane mine	B-33
Cuttysark (Blue Talc)	B-47
Diana group	B-11
Divide and Ridge (Mercedes)	B-53
Doctor No. 2	B-52
Duggan's prospects	B-12-13
Golden West	B-35
Gopher lode	B-14
Gordelia (Gold King)	B-36
Grand View Mining Co	B-15
Homelode	B-16
Huney property	B-17
Inca (Fairview group)	B-48
Jenny Gulch mine	B-18
King of the West (North Star)	B-37
Lookout	B-54
Lucky Strike	B-38
Marigold Mining & Milling Co	B-57
Mariposa mine	B-24
Mary Belle	B-58
Midnight prospect	B-19
Minnesota Ridge Mining Co	B-39
Montana	B-41
Montezuma	B-42
Omega group	B-25
Poisoned Ox group (Copper Glance)	B-50
Queen Bee	B-26
Ray	B-43
Safe Investment	B-44
Standby	B-45
Sunbeam (Payday)	B-27
Woodchuck	B-28
Yellow Bird (Dexter lode)	B-40

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Silver

Name	Serial No.
Alexander lode	B-10
Ama Queen	B-56
Ashley & Nyswanger (Dexter claim)	B-51
Black Eagle	B-29
Black Hills Copper Co	B-30
Black Tom (Barnes group)	B-21
Burlington lode	B-22
Calabogia	B-46
Cochrane mine	B-33
Cuttysark (Blue Talc)	B-47
Diana group	B-11
Divide and Ridge (Mercedes)	B-53
Doctor No. 2	B-52
Duggan's prospects	B-12-13
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Gopher lode	B-14
Gordelia (Gold King)	B-36
Grand View Mining Co	B-15
Homelode	B-16
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Jenny Gulch mine	B-18
King of the West (North Star)	B-37
Lookout	B-54
Lucky Strike	B-38
Marigold Mining & Milling Co	B-57
Mariposa mine	B-24
Mary Belle	B-58
Midnight prospect	B-19
Minnesota Ridge Mining Co	B-39
Montana	B-41
Montezuma	B-42
Omega group	B-25
Queen Bee	B-26
Ray	B-43
Safe Investment	B-44
Standby	B-45
Sunbeam (Payday)	B-27
Woodchuck	B-28
Yellow Bird (Dexter lode)	B-40

Copper

Ashley & Nyswanger (Dexter claim)	B-51
Black Hills Copper Co	B-30
Custer Peak Copper Co	B-34
Gopher lode	B-14
Jenny Gulch mine	B-18
Poisoned Ox group (Copper Glance)	B-50

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Lead

Name	Serial No.
Alexander lode	B-10
Calabogia	B-46
Grand View Mining Co.	B-15
Homelode	B-16

Antimony

Alexander lode	B-10
Homelode	B-16

Iron, pigment

Blakely Bog iron deposit	B-1
Cottrill Bog iron deposit	B-7
Dungey Bog iron deposit	B-9
Hausle Bog iron deposit	B-8
Lessering Bog iron deposit	B-2
Melchert Bog iron deposit	B-5
Negro Gulch Bog iron deposit	B-6
Swilley Gulch Bog iron deposit	B-4
Tilson Gulch Bog iron deposit	B-3

Uranium

Poisoned Ox group (Copper Glance)	B-50

Nonmetals

Cement

South Dakota State cement plant	B-60

Graphite

Carbon King	B-31-32
Copper Cliff Co.	B-55

Gypsum

U. S. Gypsum Co.	B-59

Limestone

Dakota Lime & Brick Co.	B-62
Hills Materials Co.	B-61
South Dakota State cement plant	B-60

Shale

South Dakota State cement plant	B-60

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B-1, Blakely Bog Iron Deposit, Iron, Pigment,
Rochford District, Pennington County

The Blakely property consists of 1 mining claim in the SE1/4 sec. 22, T. 2 N., R. 3 E. 3/4 mile west-southwest of Rochford. It is owned by Ed Blakely of Rochford, S. Dak.

The deposit of bog iron occurs in a small, east-flowing tributary of Smith Gulch. The valley flat is about 100 feet wide, but very limited exposures made it impossible to determine the length of the deposit until mining operations were begun. Two carloads, totaling 100 tons of iron ore, were taken from the property in 1950. This is reported to have exhausted the deposit.

The iron was shipped to St. Louis for use as paint pigment.

B-2, Lessering Bog Iron Deposit, Iron Pigment,
Rochford District, Pennington County

This property, locally called the Iron lode, consists of two mining claims totaling 40 acres. One lies in each fork of a small tributary of the South Fork of Rapid Creek. They are located in sec. 19, T. 2 N., R. 3 E., about 4 miles west of Rochford. In 1944 Carl Leute purchased the claims from John Lessering and Einar Peterson of Rochford, S. Dak., and also filed on an additional claim in each gulch.

The bog iron lies in the valley bottom in thicknesses up to 10 feet. There is little overburden. Microscopic examination shows the ore to be goethite surficially altered to limonite. Clay and schist pebbles are the principal impurities. One analysis of shipping ore had an iron content of 56 percent, with 0.027 percent phosphorous and 3.02 percent insoluble.

Mining, until taken over by Leute, was by selective hand mining from two open pits. No. 1 was 200 by 54 by 6 feet; No. 2 was 300 by 70 by 3-1/2 feet.

Production from the original Lessering claims was as follows:

		Tons	Value
1942	-	1,230	
1943	-	1,678	$ 6,712
1944	-	1,038	$ 4,671

Leute mined from the deposit in 1945, 1947, and 1950, but the production figures are not available. All material has been shipped to the George F. Mephan Co. of St. Louis for use as paint pigment.

Ref.: 61, 1942, 1944.

B-3, Tilson Gulch Bog Iron Deposit, Iron, Pigment,
Rochford District, Lawrence County

This property, owned by Claude and Ray Prothero of Nahant, S. Dak., is located at the mouth of Tilson Gulch, in sec. 33, T. 3 N., R. 3 E. It lies adjacent to the Chicago, Burlington & Quincy Railroad at Nahant. Outcrops are poor, and the deposit is not well opened up at the present time.

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Shipments of bog iron were made from Tilson Gulch as early as 1893-94, when 165 cars were shipped to the smelters at Omaha, Neb., and Kansas City, Mo., for use as flux.

B-4, Swilley Gulch Bog Iron Deposit, Iron, Pigment,
Rochford District, Lawrence County

Deposits of bog iron occur intermittently along Swilley Gulch for more than 1 mile in secs. 9 and 10, T. 2 N., R. 3 E. Individual outcrops are up to 20 feet in width and are about 2 feet in thickness. The iron, in the form of limonite and goethite, is currently being deposited in many of the boggy creek bottoms in the Rochford area. The iron is believed to have been leached from the pyritic, graphitic slates and schists that crop out within the area. Subsequent deposition as the oxide occurs in swampy bottoms where decaying vegetation is present.

Between 1,200 and 1,500 tons of bog iron ore were produced from Swilley Gulch in 1950.

B-5, Melchert Bog Iron Deposit, Iron, Pigment,
Rochford District, Lawrence County

This property, owned by A. F. Melchert of Rochford, lies in secs. 33 and 34, T. 3 N., R. 3 E. and in sec. 3 of the adjacent township to the south. It is 1/2 mile south of Nahant, and adjacent to the Chicago, Burlington & Quincy Railroad. It is currently under lease to Fremont F. Clarke of Rapid City, S. Dak.

Bog iron is intermittently exposed over a width of 500 feet, and for a distance of approximately 1/2 mile along the creek. Like other deposits in this area, the iron is in the form of goethite and limonite; most of the impurities consist of clay, pebbles, and organic matter washed in during deposition of the iron oxide. The source of the iron is believed to be the pyritic, graphitic slate and schists of the nearby area.

No production is recorded from the property.

B-6, Negro Gulch Bog Iron Deposit, Iron, Pigment,
Rochford District, Lawrence County

The bog iron deposits in Negro Gulch are located in sec. 4, T. 2 N., R. 3 E. about 3 miles northwest of Rochford and 1/2 mile west of the Chicago, Burlington & Quincy Railroad tracks.

The deposit is narrow, rarely over 50 feet, but it extends for at least 1/2 mile along the bottom of the gulch. Until recently, it had not been well prospected and outcrops indicated only a 2-foot thickness. Most of the iron is fairly clean; in some places pebbles and clay have been washed into the valley bottom as the iron was deposited.

There was no production from the gulch until 1950, when Fremont F. Clarke and Carl Leute mined 1,000 tons of bog iron for shipment to St. Louis.

B-7, Cottrill Bog Iron Deposit, Iron, Pigment,
Rochford District, Pennington County

The Cottrill property, owned by Fred Cottrill of Rochford, is located in the E1/2 sec. 34, T 2 N., R. 3 E., about 3 miles south of Rochford and 1 mile south of the old town of Myersville. It consists of six claims along a narrow south flowing tributary of Castle Creek.

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The known deposit has a width of 20 feet, a depth of 2 feet, and a length of 50 feet, but the deposit probably extends intermittently along the entire length of the property.

No production has been recorded from the Cottrill property.

B-8, Hausle Bog Iron Deposit, Iron, Pigment,
Rochford District, Pennington County

The Hausle property (Double Star claim) lies along Hobbs Creek in the NW1/4NW1/4 sec. 16, T. 2 N., R. 3 E. 3.7 miles northwest of Rochford. Originally owned by Mike Hausle, it is now owned by his son, Albert Hausle of Spearfish, S. Dak.

The deposit consists of bog iron in the form of limonite and goethite. It extends along the bottom of a narrow creek for about 1,000 feet, is 40 to 60 feet wide, and reaches a thickness of 10 feet. Analyses show 44 to 51 percent iron, 0.03 percent phosphorous, and about 1 percent sulfur.

This deposit was opened about 1900 to supply raw pigment for the paint-grinding plant at Custer, S. Dak. Shipments were made to St. Louis in 1925. Ore has come from a pit, which is now about 100 feet long, 40 to 60 feet wide, and up to 10 feet in depth. The ore near the center of the deposit is relatively clean, but along the valley edges much clay and schist have been washed in as the iron was being deposited.

Production

1900 - 29 or 30 cars shipped to Custer, then Aurora, Ill.
1925 - 500 tons shipped to St. Louis
1940 - 640 tons shipped to St. Louis
1941 - 2,150 tons shipped to St. Louis

Ref.: 12, pp. 217-218; 61, 1940, 1941.

B-9, Dungey Bog Iron Deposit, Iron, Pigment,
Rochford District, Pennington County

The Dungey property is located astride the Lawrence-Pennington County line in secs. 7, 8, 17, 18, T. 2 N., R. 3 E. about 3 miles west-northwest of Rochford. It is owned by Ed Dungey of Rochford.

Very inadequate testing indicates an area 500 by 900 feet underlain by 0 to 7 feet of bog iron. The valley in which the deposit lies is wide and flat, suggesting that the deposit may extend both laterally and along the stream for a greater distance than indicated.

Available analyses of the ore indicate an average of 46 percent iron, 12 percent silica, 0.025 percent phosphorous, and sulfur in quantities ranging from 0.03 to 3.11 percent.

No shipments have been made.

B-10, Alexander Lode (M.S. 592), Gold, Silver, Lead,
Antimony, Silver City District, Pennington County

The Alexander claim is part of the Morrow property. There were originally four claims in the group, but only one was retained. It was patented in February 1893

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and is now owned by Frank Morrow. It is also referred to in early reports as the Alexandria or Lady of the Hills. The claim lies on the ridge between Sunnyside and Lightning gulches, 1 mile northwest of Silver City in the NW1/4 sec. 31, T. 2 N., R. 5 E.

Ore occurs as quartz veins within the pre-Cambrian schists. The quartz veins, up to 1 foot in width, contain irregular stringers of jamesonite up to 3 or 4 inches in width. Microscopic studies made at the South Dakota School of Mines by Frank Hoffman and Paul R. Fenske show successive deposition of siderite, pyrite, chalcopyrite, and jamesonite, along with the continuous deposition of quartz. Assays of the sulfides show up to 0.5 oz. gold and 35 percent antimony but very little silver.

Workings consist of several drifts and prospect holes along the strike of the vein. There is no record of production.

A-11, Diana Group (Comstock), Gold, Silver,
Silver City District, Pennington County

This group of 7 unpatented claims originally belonged to John Gorman of Silver City and is frequently referred to in the literature merely as Gorman's mine or as the Diana mine. In recent years Joseph Burke of Silver City has managed it for the Gorman estate. The group totals only 70 acres and is located in the SW1/4 sec. 31, T. 2 N., R. 5 E. just north of Rapid Creek. Claims are the Diana, Meadowlark, Deep Channel, Mammoth, Consolidated, Depot, and Comstock.

Development consists of 515 feet of tunneling. The main tunnel is about 450 feet long and crosscuts the schistosity of the country rock. The roof is in part a shear plane.

Microscopic examination of the ores made by students at the South Dakota School of Mines shows pyrite, pyrrhotite, and jamesonite in milky quartz. An assay of a random piece gave gold 0.06 oz., silver 4.00, antimony 0.50, and lead 0.70.

Two tons of ore is reported to have been shipped before 1891. There is no record of subsequent production.

B-12-13, Duggan's Prospects, Gold, Silver,
Silver City District, Pennington County

Several lead-silver prospects were developed by John Duggan in the Silver City area around 1900.

One of these, now referred to as Duggan's Whim, is located in the SW1/4 sec. 31, T. 2 N., R. 5 E. about 1/4 mile west of Silver City. It consists of a shaft 100 feet deep exposing a quartz vein carrying galena and pyrite.

The other prospect, referred to as Duggan's shaft, is located in the NW1/4 sec. 6, T. 1 N , R. 5 E., 1/2 mile southwest of Silver City. Development followed a 6-inch quartz vein carrying galena and pyrite. One assay on record indicates 0.02 oz. gold, 4 oz. silver, and 3 percent lead.

There is no record of production from either of these prospects.

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B-14, Gopher Lode, Copper, Gold, Silver,
Unorganized District, Pennington County

The Gopher lode is in the SW1/4, sec. 16, T 1 N., R. 2 E., about 17 miles southwest of Rochford, S. Dak. The property, consisting of 5 unpatented claims, 1 patented claim, and 1 millsite, totals about 150 acres. Ole Scholt of Deerfield and Mart Ebner of Hill City own the claims.

The deposit is a small fissure vein containing copper, gold, and a little silver. Little is known of the size or value of the vein.

Development is by 80 feet of drifts and crosscuts and two small open cuts. No production has been reported; the property has been idle for years.

Ref.: 36, p. 141.

B-15, Grand View Mining Co., (M.S. 1948), Lead, Gold,
Silver, Silver City District, Pennington County

Claims of the Grand View Mining Co. lie in the SE1/4 sec. 25, T. 2 N., R. 4 E. 1-1/2 miles northwest of Silver City. The property was bought from Pennington County by Francis Hoffman in 1937.

The pre-Cambrian rocks in the Silver City district have a N. 60° W. strike and are nearly vertical. A series of narrow vertical veins cuts across the regional structure and has a strike of N. 45° E. These vary from a fraction of an inch to 24 inches in thickness and consist of quartz with jamesonite (lead sulphoantimonide), arsenopyrite, pyrite, sphalerite, and chalcopyrite. High-grade ore is said to average 0.8 oz. gold and 2 oz. silver per ton. The gold occurs as free gold in the jamesonite and is amenable to amalgamation. Silver is probably also in the jamesonite but cannot satisfactorily be recovered by amalgamation.

Workings on the Grand View property include 5 shafts ranging from 35 to 110 feet in depth, No. 1 on the Grand View claim, No. 2 on the Standard, and Nos. 3 to 5 on the Grand View No. 4 claim. A small stamp mill was built just south of shaft 1 before 1905, and a small production of "lead concentrates" was reported in 1906. Some sampling and development was done by Hoffman in 1939-40.

Ref.: 12, p. 186.

B-16, Homelode, Gold, Silver, Lead, Antimony,
Silver City District, Pennington County

The Homelode property, consisting at present of the Stibnite group of 7 unpatented claims, lies at the head of Jenny Gulch in the C S1/2 sec. 24, T. 2 N., R. 4 E.

Country rock is nearly vertical, pre-Cambrian schist, which strikes N. 25° W. A vein dipping 9° west and essentially conformable with the country rock contains quartz, jamesonite, arsenopyrite, pyrite, and sphalerite. Development consists of a shaft to the 38-foot level, where a 12-foot offset to the west occurred in the vein. At the end of the 12-foot crosscut a winze was put down to a total depth, including sump, of 200 feet. There is 221 feet of crosscutting and drifting on the 85-foot level, a short crosscut to the ore on the 125-foot level, and 320 feet of drifting and crosscutting on the 185-foot level.

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This work was apparently done in 1916-18. The original Homelode Mining Co. held several mining properties in the Silver City area as early as 1914. Exploration and development was begun on the Grand View group but soon shifted to the present Homelode property. The old Grand View mill was moved to the Homelode site in 1916 and rebuilt as a 30-ton concentration amalgamation plant. In 1917 a total of 450 tons of ore was put through the mill, resulting in recovery of 15 tons of concentrates valued at $1,850.

The Jenny Gulch Mining Co., organized in 1935, unwatered and sampled the mine in the fall of 1938. Recent assessment work has been done by Amunsen, Filmore, and Brown.

Ref.: 17, p. 28; 36, p. 144; 61, 1914, pp. 16-17.

B-17, Huney Property, Gold, Silver, Silver City District, Pennington County

The Huney property is located 2 miles northwest of Silver City, in the NE1/4 sec. 25, T. 2 N., R. 4 E. It is also known as the old Tom Gorman ground after its original owner.

Mineralization is reported to be similar to that in the Homelode and Grand View mines. Presumably jamesonite, pyrite, and other sulfides occur in quartz stringers cutting the pre-Cambrian schist of the area.

A two-compartment shaft, reported to be 60 feet deep, and an open cut constitute the workings. A 10-stamp mill was operated for a short while in the early days of the district on ore said to have been taken from the open cut. There is no record of the production.

B-18, Jenny Gulch Mine, Gold, Silver, Copper, Silver City District, Pennington County

Property held by the old Jenny Gulch Mining Co. lies on the line between secs. 29 and 32, T. 2 N., R. 5 E. on the east side of Jenny Gulch, about 1 mile airline northeast of Silver City.

History is very imperfectly known. About 1905 the Jenny Gulch Mining & Milling Co. is reported to have held 17 claims totaling 320 acres.

Development on the property consists of a 600-foot tunnel, two inclined shafts, and a shorter drift. Two hundred feet in from the portal of the tunnel, cross drifts extend from 40 feet northwest and 20 feet southeast. The tunnel cuts slates with oxidized pyrite, and, since it has been driven, limonite has accumulated to a depth of 2 or 3 feet in the far end of the drift. The inclined shafts are 25 and 30 feet deep, and the shorter drift is reported to have been 49 feet long.

One sample of ore from the main drift is said to run only 0.01 oz. gold. Indications of copper were reported on their Yuetta claim.

There is no record of any production from the property.

B-19, Midnight Prospect, Gold, Silver, Silver City District, Pennington County

The holdings of the old Midnight Mining Co. lie in Sunnyside Gulch, about 1-1/2 miles northwest of Silver City. They are located in the NW1/4SW1/4 sec. 30, T. 2 N.,

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R. 5 E. and extend over into sec.25 of the adjacent township. They lie due east of the Grand View group.

Mineralization occurs in narrow quartz veins cutting the pre-Cambrian schist. Ore on the dump shows pyrite and jamesonite in milky quartz. It is similar to the Grand View and Homelode ore.

The Midnight Mining Co. became active in 1915, setting up a sawmill on the property and ordering mining equipment. By early 1916 a compressor and hoist had been received and shaft sinking was begun. It is not known to what depth the shaft was sunk, but from the size of the dump it must have been only a few tens of feet. Activity ceased in 1917.

No production is recorded from the Midnight Co.

Ref.: 36, p. 150.

B-21, Black Tom, Gold, Silver, Unorganized District, Pennington County

The Black Tom, or Barnes group, consists of three unpatented claims in Skull Gulch 4-1/2 miles southeast of Mystic in sec. 22 or 23, T. 1 N., R. 4 E. It is owned by Ray M. Clarke of Keystone, S. Dak.

Mineralization occurs along a shear zone within the pre-Cambrian slate and schist. Development is reported to consist of an 80-foot shaft and 150 feet of tunneling.

A 10-stamp mill was reported on the property in 1905. Five stamps were dropped for at least 30 days that year; then the mill was shut down, presumably to add a cyanide unit. There has been no activity since 1908.

No production records are available.

Ref.: 36, p. 124.

B-22, Burlington Lode, Gold, Silver, Hill City District, Pennington County

The Burlington lode lies 4-1/2 miles north of Hill City in Burnt Fork Gulch. It is between the Payday and the Crain lodes and lies on the SW1/4 sec. 35, T. 1 N., R. 4 E. The original Burlington group (M.S. 1965) consisted of 6 claims totaling 118 acres and includes the Crain.

A 3- to 4-inch quartz vein carrying free gold strikes N. 20° E., and dips 75° to the west. The schist country rock has a steep dip and strikes N. 40° W.

Development consists of an inclined shaft following down the vein for approximately 107 feet. Development ceased abruptly in 1908 when a blast at a station at the bottom of the shaft killed two men, including J. B. Taylor, president of the company and manager of the operations of the Black Hills Copper Co. west of Rochford.

Production records are confused. Allsman credits this property with a yield of $6,000 in gold in 1897, but this almost certainly came from the Burlington mine in the Bald Mountain district. The following other records are available:

1904 - 4 tons of ore yielded 9.68 oz. gold
1916 - 2 tons of ore yielded 6.00 oz. gold

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Ref.: 1, p. 86; 2, 1904, p. 188; 61, 1908, p. 16.

B-24, Mariposa Mine, Gold, Silver, Mystic District, Pennington County

Workings of the old Mariposa Gold Mining & Milling Co. lie on Slate Creek in sec. 10, T. 1 N., R. 4 E., about 2 miles southeast of Mystic. This property also appears in reports as the Merry Posey and Mary Posey. The ground was later filed upon as the Slate Creek lode, and in 1941 was refiled as the Third Time lode by Walter Wilson and J. E. Bramblette of Mystic.

The Mariposa Gold Mining & Milling Co. was formed by Minnesota interests in 1905. It originally included eight claims. Previous development included a 35-foot shaft on the Mariposa claim and a 30-foot shaft on the Blair claim. Exploration apparently followed a mineralized fracture zone within the pre-Cambrian slate. The Mariposa Company drove a 500-foot drift beginning 40 feet above the creek. Two crosscuts and some stoping, and a raise to the surface are reported near the back end of the tunnel. Bearing of the main drift is S. 55° W. The portal was badly caved in 1950.

A small mill was built on the property, presumably by the Mariposa Co., but no record of its operation or production is available. There is no record of any activity after about 1906.

Ref.: 4, 1905, p. 300.

B-25, Omega Group, Gold, Silver, Unorganized District, Pennington County

The Omega group of 28 claims and fractions centers in sec. 17, T. 1 N., R. 5 E. in the so-called unknown district about 3 miles southwest of Pactola. Although optioned at one time to New York interests, the property has been held for the last 50 years first by J. C. Sherman and subsequently by his son Charles Sherman of Pactola.

The supposed ore body lies along a shear zone 100 to 150 feet wide, which strikes N. 40° W. and dips 75° northeast. The rocks involved are pre-Cambrian schists and slates. It is believed that the shear zone is mineralized throughout its width and that it thus constitutes a large mass of low-grade ore.

Development is by numerous test pits, trenches, and shallow shafts and by a 300-foot adit on the Omega claim. Most active development seems to have been between 1895 and 1905. It has never advanced beyond the prospect stage.

Ref.: 1, p. 89.

B-26, Queen Bee, Gold, Silver, Unorganized District, Pennington County

The Queen Bee property consists of 7 patented claims totaling 64 acres and is located 7 miles northwest of Hill City near the corner common to secs. 22, 23, 26, and 27, T. 1 N., R. 4 E.

The country rock is dark slate and schist of pre-Cambrian age. Mineralization appears to have followed the crest of a steeply plunging anticline. Near the surface sulfides occur in minor fractures and bedding planes, but with depth the ore body appears as two highly mineralized beds or veins each 3 feet in width.

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The Queen Bee Gold Mining & Milling Co. apparently did some mining from open cuts about 1906. Development work done at that time consists of 2 open cuts, a 60-foot tunnel, a 40-foot shaft, and 155 feet of drifting and crosscutting. No production is recorded.

The mine was unwatered, mapped, and sampled in 1934 by A. I. Johnson of Keystone, S. Dak.

Ref.: 1, pp. 87-88; 36, p. 156; 61, p. 30.

B-27, Sunbeam (Payday), Gold, Silver, Unorganized District, Pennington County

The Payday group, consisting of 4 patented claims in Friday Gulch, is located in sec. 35, T. 1 N., R. 4 E. 5 miles northwest of Hill City. It was known as the Hawk Wright ground before 1901.

The ore lies in a narrow vertical vein of gold-bearing quartz cutting the pre-Cambrian schists. Early production records mention pockets of very rich ore.

The property was purchased by Webb and Chalmers in 1901 and organized as the Sunbeam Mining Co. Development, done under their direction consisted of a 450-foot, double-compartment, inclined shaft and about 500 feet of drifting and crosscutting. A 10-stamp amalgamation mill was built in 1901 but was not used regularly until 1904.

Lincoln reports some activity at the property in 1911. In 1934 the mill was reconditioned, some additional equipment was installed, and a small tonnage of ore from the dump was run through it. There has also been some placer activity on the property. The mill was gone, but the shaft was open to water in 1950.

Production figures from the mine are as follows:

1905 - 45 tons valued at $125 per ton
1934 - 26 tons valued at $16 per ton

Ref.: 1, pp. 86-87; 2, p. 191; 36, p. 155; 61, 1902, p. 23.

B-28, Woodchuck, Gold, Silver, Hill City District, Pennington County

The Woodchuck property consists of 1 unpatented claim located in sec. 34, T. 1 N., R. 4 E. 5 miles northwest of Hill City.

Mineralization occurs in a narrow shear zone within the pre-Cambrian schist. Development has been by open cuts.

History of the property is confined to 1932, when a small mill was built and 150 tons of ore treated. The mill, which included a 7- by 10-inch Blake crusher, a Lane mill, and amalgamation plates, was built from old equipment and gave unsatisfactory results. According to Allsman, recovery from $2 to $3 ore was $0.45 per ton.

There has been no activity since 1932, and the equipment has been removed from the property.

Ref.: 1, p. 87; 36, p. 166.

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B-29, Black Eagle, Gold, Silver, Rochford District, Pennington County

The Black Eagle mine is located 4 miles southwest of Rochford in the SE1/4 sec. 33, T. 2 N., R. 3 E. The original property consisted of 112 acres and was previously known as the Blair group. It is a short distance northwest of the old Golden West mine and lies on the same outcrop of cummingtonite schist. The ore was presumably a replacement along a shear zone cutting the pre-Cambrian schist and quartzite.

Extensive development was done between 1897 and 1904 by the Black Eagle Gold Mining & Milling Co., financed largely by capital from Logansport, Ind. Ore was stockpiled in 1898 and hauled to the Montezuma mill at Rochford in 1899. Development consists of 5 shafts, each reportedly between 75 and 120 feet in depth, an 800-foot adit, and 400 to 500 feet of drifting and crosscutting.

A 50-ton Huntington mill was built in 1904, and both mine and mill began operating in July of that year. During a test run, $1,240 in gold and $35 in silver were recovered from 606 tons of ore. There is no subsequent record of its operations. Buildings were collapsed and workings inaccessible in 1950.

Ref.: 1, p. 117; 2, p. 187; 12, p. 130; 43, pp. 770-773.

B-30, Black Hills Copper Co., Copper, Gold, Silver, Rochford District, Pennington County

The holdings of the Black Hills Copper Co. originally consisted of 25 claims centering in sec. 30, T. 2 N., R. 3 E., 5 miles southwest of Rochford. Five patented claims, including the Climax and Bee (M.S. 1912) the Solnar, and Copper Reef Nos. 1 and 2 (Pat. No. 1913), are now owned by W. A. Reynolds of Deerfield.

Copper was first reported in this area about 1886, but active promotion and development was confined to 1899-1904.

Mineralization occurs in a shear zone in a graphitic schist of Algonkian age. The zone, which varies from 70 to 100 feet in width, has been traced along a northwest strike for at least 1 mile. It dips sharply to the east. Copper minerals on the surface are azurite and malachite, presumably alteration products from the small quantities of chalcopyrite in the pyritic schists.

Two open cuts, each 20 by 30 feet, and several smaller assessment pits are accessible. A shaft, now caved, is reported to have been over 800 feet deep and inclined at 60° to the east. A total of 595 feet of crosscuts and drifts are reported on the 100-, 400-, and 800-foot levels.

Scattered reports indicate that about 800 tons of ore was shipped to local smelters and to Omaha before 1902. A shipment of 38 tons of ore containing 6.12 percent copper and 2.34 oz. silver per ton was made in 1917 from dump and surface workings.

Ref.: 12, pp. 130, 210; 36, pp. 125-126; 61, 1902, p. 22, 1917, pp. 16-17.

B-31-32, Carbon King, Graphite, Unorganized District, Pennington County

The Carbon King property includes the Carbon King group in sec. 2 and the G & H group in sec. 4, T. 1 N., R. 3 E. about 5 miles southwest of Mystic. Each group

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contains 2 claims of 20 acres each. They are held by location by J. B. and Vincent Cordes.

Graphitic zones within the pre-Cambrian schist apparently represent organic matter in the original sedimentary rocks. These beds are conformable to the bedding of the original sediments but now lie at steep angles owing to the intense folding of the pre-Cambrian rocks. Most of the graphite in the Lead and Rochford areas occurs in the Flag Rock formation, and the zones may be followed for many miles.

On the G & H property, two 15-foot beds or veins of graphite occur. They strike N. 40° W., dip 75° to the northeast, and are about 150 feet apart. Development has been by trenching along the strike 35 and 50 feet. On the Carbon King a single graphite zone strikes N. 10° W., dips 75° northeast, and is 25 feet wide. It has been exposed by a series of shallow prospect cuts across the strike. Both deposits are characterized by numerous quartz stringers and limonite streaks. Laboratory tests indicate that the crude samples run 16 to 21 percent graphitic carbon.

B-33, Cochrane Mine, Gold, Silver,
Rochford District, Pennington County

The Cochrane (Mineral group) property lies 2 miles southwest of Rochford near the southwest corner sec. 26, T. 2 N., R. 3 E. It originally included 40 unpatented claims a short distance south of the old town of Myersville.

The ore occurs in a shear zone in pre-Cambrian schists, which strike north-northwest and dip steeply to the east.

About 1883 the Alta Lodi Mining Co. built a 40-stamp mill, but failed to develop ore and abandoned the property. Five claims were relocated by James Cochrane in 1892, and a 16-ton Huntington mill was built the following year. Cochrane operated during the summer seasons up to 1906 and continued development work through 1917. Early development included two 100-foot shafts, 200 feet of drifting, and 2 large open cuts about 1,200 feet apart. Cochrane died in the winter of 1930-31 and the property was willed to a daughter. Between 1931 and 1936 considerable sampling was done, a 40-foot exploration shaft was sunk in the large south open cut, and ore was mined and milled, as indicated below.

Early reports claim a production of $35,000 from this group before 1904. However, recorded production figures are as indicated:

	Tons	Value	Gold, oz.	Silver, oz.
1899		$ 9,000		
1904	70		15	
1905	93		19.35	
1906	300		84.22	54
1931	162		81.06	55
1932	150		24.91	18
1936	4,200		128.37	86

Ref.: 1, p. 116; 2, p. 189; 12, pp. 130-134; 43, p. 770-773; 61, 1899, 1911, 1915, 1916.

B-34, Custer Peak Copper Co., Copper,
Rochford District, Lawrence County

The property of the old Custer Peak Copper Co. lies in secs. 13 and 24, T. 3 N., R. 3 E. and in secs. 18 and 19, T. 3 N., R. 4 E., about 3 miles airline southeast of

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Custer Peak. It originally comprised about 2,200 acres, including the Jungle mine at Roubaix.

Mineralization of a graphitic zone within Algonkian schist is similar to that of other copper prospects in the Black Hills. Primary minerals include pyrrhotite, pyrite, and some chalcopyrite. Oxidized ores at the surface are iron oxides and the more conspicuous oxides and carbonates of copper.

Numerous test pits and three shafts are reported on the property. The principal shaft reached a depth of 250 feet, the others are said to have been 65 and 90 feet in depth. The old Minerva gold mill was moved onto the property in 1917 and rebuilt, but aside from mill tests it was never put into operation.

Greatest activity of the company was around 1900; the last work done on the property was early in 1919. The only recorded production was in 1918, when 40 tons of ore valued at $620 were shipped, apparently from the Jungle mine at Roubaix. The mill on the Jungle burned down in the forest fire of 1942.

Ref.: 12, p. 210; 36, p. 98; 61, 1917, pp. 6, 8, 11.

B-35, Golden West, Gold, Silver, Rochford District, Pennington County

The Golden West mine is located in the NW1/4 sec. 3, T. 1 N., R. 3 E., about 4 miles southwest of Rochford. The property consists of 10 patented and 3 unpatented claims and is owned by Dr. R. H. Weeth of New York, N.Y.

The ore body is a replacement along a flat-lying fault zone cutting pre-Cambrian cummingtonite schist. Ore minerals are pyrrhotite and arsenopyrite; most of the gold is associated with the latter.

This was known as the Benedict property until 1902 when the Golden West Co. was organized. The mine operated from 1899 to 1907. Development was by open cut, shaft, and drifts, totaling about 900 feet. Fifteen drill holes were drilled to depths of about 150 feet. Most of the ore came from an open cut roughly 100 by 300 feet in area and up to 35 feet deep. It was transported by aerial tramway to a Chilean mill on Castle Creek. Mill capacity was apparently increased from 12 to about 100 tons during the 6 years of operation.

The company was reorganized as the New Golden West in 1915, and development continued through 1916. Further geologic and metallurgical examination of the property was made in 1932-33.

Recorded production is as follows:

Year	Ore, tons	Gold, oz.	Silver, oz.
1902	500	120.93	-
1903	1,300	251.00	-
1905 (?)	10,000	598.50	119
1906	5,835	349.99	118
1907	287	55.49	21

Another report gives a yield of $3,006 for 1902 and $4,000 for 1903. The 10,000 tons reported above for 1905 is said to have been milled in 1904 at a milling cost per ton of $0.41.

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Ref.: 1, pp. 118-120; 2, p. 183; 12, pp. 130-134; 36, p. 139; 43, pp. 770-773; 61, 1902, p. 22, 1915, 1916, p. 16.

B-36, Gordelia (Gold King), Gold, Silver,
Rochford District, Pennington County

The Gordelia mine lies on Silver Creek 1-1/2 miles northeast of Rochford in the SE1/4 sec. 13, T. 2 N., R. 3 E. The property consists of 19 unpatented claims totaling about 348 acres.

Mineralization is a replacement in pre-Cambrian quartz-cummingtonite schist, apparently similar to that in the Standby and other properties in the so-called hornblende belt.

The ground was worked as early as 1879 by the Charter Oak Co. In 1901 the Columbia Mining Co. acquired all of the property on lower Silver Creek, except 100 acres owned by the Silver Creek Mining Co. Columbia did extensive development work from 1901 to 1905, when it was succeeded by the Gordelia Mining Co. A 10-stamp amalgamation mill was built on the property in 1906 by Gordelia, but its operation was apparently not successful. By 1911 the property was owned by the Gold King Mining Co., a subsidiary of the Black Hills Development & Financial Co., which tried to revive the Rochford and Carbonate districts shortly before World War I. Development work was carried on until 1922.

Development consisted of several surface cuts and trenches and four shafts, with some drifting and crosscutting. Shafts are reported to have been 50, 85, 100, and 185 feet deep.

Production records are limited to a report of 12 oz. of gold recovered from 100 tons of ore during a mill run in 1907.

Ref.: 1, p. 124; 12, p. 130; 36, p. 140; 43, pp. 770-773; 61, 1912, p. 9, 1914, p. 22.

B-37, King of the West (North Star) Gold, Silver,
Rochford District, Pennington County

The King of the West property consists of 16 unpatented claims lying at the head of Smith Gulch in the NW1/4 sec. 33, T. 2 N., R. 3 E. Early history, dating back to the late 1880's, is obscure. A strike made on this property in 1897 by August Oberg caused activity in the entire Rochford district. Ore from the King of the West was hauled to the Montezuma mill at Rochford. The North Star Mining Co. milled ore in their own 25-ton Chilean mill in 1908-9. The Homestake Mining Co. took an option and did considerable exploration work in 1925-26. The King of the West Mining Co. was incorporated in 1934 by James L. Curran and associates of Lead, S. Dak. These operators did additional development work, built a 50-ton cyanide mill, and operated for a few months in 1935-36.

The ore occurs as a replacement in pre-Cambrian cummingtonite schist, which strikes N. 30° E. and dips 65° southeast. Mineralization, consisting primarily of pyrite and arsenopyrite, with lesser quantities of pyrrhotite and marcasite, occurs in the crest of a sharp fold plunging 70° northeast.

Early workings included two shallow shafts and an open cut. Recent development consists of a 150-foot shaft, with drifts on the 50- and 75-foot levels.

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The only recorded production from the property is as follows:

Year	Ore, tons	Gold, oz.	Value recovered
1908	130	25.01	-
1909	65	11.03	-
1935	4,046		$ 9,817.37
1936	2,944.4		13,257.61

Ref.: B. H. Engineer, Jan. 1937, pp. 191-195; 1, pp. 114-116.

B-38, Lucky Strike, Gold, Silver, Roubaix (Germania) District, Lawrence County

The Lucky Strike group consisted of 313.5 acres of patented ground on North Box Elder Creek, centering in sec. 18, T. 3 N., R. 5 E. 0.3 mile southeast of the old station of Greenwood.

The ore was apparently included in a large mass of quartz-hematite conglomerate, which is believed to be one of the oldest formations within the pre-Cambrian rocks of the Black Hills area. Scattered reports indicate that 2 short drifts and a 135-foot shaft with a short crosscut on the 85-foot level were driven on the Bird claim. On the Funston claim near the north end of the property, Hattenbach Brothers of Deadwood were reported to have operated a small stamp mill about 1883. Ore was taken from the bottom of a 50-foot shaft. Active development by the Lucky Strike Co. began in 1904, and a grand total of 1,500 feet of development work, including a 240-foot shaft, was reported by 1906.

A 40-stamp mill capable of handling 150 tons of ore per day was bought in Colorado in 1906 and rebuilt on the property in 1906-7. It is not recorded if the mill was ever operated, though it was reported as "ready to reopen" in 1908, following some development work.

Ref.: 2, pp. 152-153.

B-39, Minnesota Ridge Mining Co., Gold, Silver, Rochford District, Lawrence County

The property originally owned by the Minnesota Ridge Mining Co. consisted of three claims, the Minnesota, Blue Bird, and Red Squirrel. The group centers in sec. 6, T. 2 N., R. 4 E., near the head of Gimlet Creek.

History is obscure, but development work is reported as early as 1891 by L. H. Enos of Rochford. A five-stamp mill was reportedly built by 1897. There is no record of early production. The property apparently lay idle until 1934, when the New Deal Mining Co. leased 6 patented claims, including the 3 above, cleaned out the mine, built a 10-stamp amalgamation mill, and ran intermittently for several months. The property was taken over by Gold, Inc., in 1937, and intermittent development was carried on into 1938. Management was taken over in 1939 by GFC Corp. of Buffalo, N.Y., and development continued through that year.

Mineralization occurs in shoots in a shear zone in the Algonkian schists. The zone strikes N. 25° W., dips steeply to the east, and is reported to reach a thickness of 35 feet. Mineralization, primarily pyrite, occurs for a width of 15 to 20 feet.

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Extensive workings are reported. The main adit is 650 feet long and, along with 600 feet of drifting and crosscuts, forms the 300-foot level. A 22-foot winze extends below the 300-foot level. A shaft from the top of the lode reaches the 200-foot level, and there is extensive development from it on the 75-, 150- and 200-foot levels.

The only production records are those of experimental mill runs by recent operators as follows:

Year	Ore, tons	Gold, oz.	Silver, oz.
1934	269	11.76	29
1935	600	25.69	47
1937	996	45.84	21

Ref.: 1, pp. 121-124; 17, p. 4; 61, 1891, p. 48.

B-40, Yellow Bird (Dexter Lode), Gold, Silver,
Rochford District, Pennington County

The Yellow Bird property at present comprises two unpatented claims in the SW1/4 sec. 28, T. 2 N., R. 3 E. 1 mile northwest of the King of the West mine and 4-1/2 miles southwest of Rochford. Assessment work on the Dexter and Dexter No. 1 is currently being done by Marie Hartsell.

Although discovery of the property dates back to the early days of the Rochford district, history of this particular mine is meager. There was some activity in 1898, the year after the discovery of the Golden West ore body on what was then called the Benedict ground. The Yellow Bird group, consisting of six claims and a fraction, and the Benedict group were bought by the newly formed Golden West Co. in 1902. The Yellow Bird group remained idle until 1938, when the Yellow Bird Mining & Milling Association did development and built a 50-ton flotation mill to treat oxidized ore. The mill ran only a few days, and the association was dissolved in 1939.

Mineralization has occurred along a shear or fault zone cutting pre-Cambrian schists. The zone is reported to strike N. 30° E., to dip southeast, and to have an average thickness of 15 feet. Workings consist of a 150-foot shaft, several shallower shafts, and some drifting and trenching.

Early reports state that $26,000 in gold was produced from 1 shaft, and $10,000 from another, but these figures are not official.

Ref.: 1, p. 116; 36, pp. 130, 132; 43, pp. 770-773.

B-41, Montana (M.S. 1697), Gold, Silver,
Rochford District, Lawrence County

The Montana mine, one of the earliest gold discoveries in the Rochford district, is located near the center of the west edge of sec. 2, T. 2 N., R. 3 E. The property included 11 patented claims totaling 193.82 acres.

Gold occurs associated with pyrite and arsenopyrite as a replacement in a quartz-cummingtonite schist. The Algonkian rocks in this area are strongly folded with a general N. 20° W. strike.

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Early workings were developed north of the present road by the Gregory Mining Co. A 20-ton mill was built on Rapid Creek about 1/2 mile south of Nahant. These ores proved to be unoxidized and not amenable to amalgamation. Exploration south of the road was inaugurated in 1901. This included a 6 by 8, 101-foot shaft, a 495-foot adit extending N. 15° W. to the base of the shaft, 444 feet of lateral drifting on the 100-foot level, and 25 feet of drifting on the 60-foot level.

The property remained idle from about 1906 to 1936. At that time the workings were cleaned out and examined by Francis C. Lincoln while under option to Dr. R. A. Vallier of Deadwood, S. Dak. Vallier purchased the mine in 1938; development was continued into 1939, but the equipment was sold off by 1941.

No production figures are available, though a very small production was reported for 1906.

Ref.: 1, p. 121; 12, p. 130; 36, pp. 111-112; 43, pp. 770-773; 61, 1902, p. 22, 1939, p. 16.

B-42, Montezuma, Gold, Silver, Rochford District, Pennington County

The Montezuma gold mine is located near the center sec. 14, T. 2 N., R. 3 E., about 1 mile north of Rochford. Six claims were held by the original company, the Montezuma Nos. 3 to 7, the New Montezuma, and the Red Jim.

Mineralization at the Montezuma is similar to that in other gold properties in the Rochford district. The ore body is a replacement in pre-Cambrian schist. Microscopic studies of the ore made at the South Dakota School of Mines indicate that the principal ore minerals are arsenopyrite, pyrrhotite, and pyrite. Gangue minerals are quartz, biotite, chlorite, cummingtonite, and ankerite.

Early history is incomplete. After considerable development a 50-ton, 20-stamp amalgamation mill was built in Rochford between 1895 and 1897. Shortly after completion it was leased to the King of the West (1898), and ore from several of the prospects in the newly discovered hornblende belt was treated in it.

Development of the Montezuma by 1899 included 3 tunnels, 1 over 600 feet in length, and a 60-foot shaft. The company has changed hands several times. Around 1905 it was operated as the Commonwealth Gold Mining Co., then again as the Montezuma Mining Co. The latter was in turn taken over by the short-lived Black Hills Development & Financial Co. in 1911.

There is no record of any production from the property.

Ref.: 12, pp. 130, 134; 43, pp. 770-773.

B-43, Ray, Gold, Silver, Rochford District, Lawrence County

The Ray gold prospect lies in the NW1/4, sec. 2, T. 2 N., R. 3 E., Lawrence County, about 4 miles north of Rochford.

The ore is a replacement in amphibolite, similar to that in most of the other properties in the so-called hornblende district. Ore minerals are pyrite, arsenopyrite, and pyrrhotite.

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The Ray Mining Co. was active in development work about 1911, at which time a 150-foot shaft was sunk. Apparently, results were discouraging for no further work has been done, and there is no record of any gold having been produced.

Ref.: 12, p. 130; 61, 1911, p. 9.

B-44, Safe Investment, Gold, Silver, Roubaix District, Lawrence County

In 1903 the newly organized Safe Investment Gold Mining Co. purchased and began developing what had been known as the Duncan Kennedy property on Box Elder Creek, 13 miles airline south of Deadwood. This consisted of 30 claims, the Pyrite and the Oregon Nos. 1 to 29, totaling 580 acres, centering on the corner common to secs. 10, 11, 14, and 15, T. 3 N., R. 4 E.

Gold was apparently associated with mineralization within some of the pre-Cambrian amphibolite that crops out in that area. Extent of the development work by the Safe Investment Co. is not known, but 1 report indicates development on the 175-foot level of their mine in 1904. Between 1905 and 1907 a 60-stamp, 20-ton mill was built. The first 20-stamp unit was ready for service in 1907. According to available records, the only use of this mill occurred in 1911 when mill tests were run on 60 tons of lead-zinc ore from the Mowee mine of the Deadwood Lead & Zinc Co. in Spruce Gulch east of Deadwood.

B-45, Standby, Gold, Silver, Rochford District, Pennington County

The Standby gold mine is located in the E1/2 sec. 23, T. 2 N., R. 3 E. 1/2 mile east of Rochford. The property consists of eight patented claims and a millsite, owned by the G & D Gold Mining Co.

The history is incomplete. By 1891 oxidized ore was being treated in a 20-stamp amalgamation mill. By 1904 unoxidized ore was being milled, but recovery was only about 30 percent. A 60-stamp mill was built in 1906; development and mill testing continued from 1907 to 1909. In 1936 the property was bought by George Beardshear and associates, and the mine and mill were renovated considerably. In 1951 the mine was still accessible, though most equipment had been removed from the mill building.

Ore occurs in a cummingtonite schist, which is correlated with the Homestake formation of pre-Cambrian age. Mineralization is similar to that in the Homestake mine at Lead. The Standby deposit lies in a syncline whose axial plane strikes S. 35° E. and whose plunge is between 65° and 70° east.

Original development was by four large open pits on the Continental and Old Standby claims. Before 1894 a drift was driven at the 175-foot level to draw ore from the open cuts. Still later (1899-1902) a 1,300-foot drift was driven south from behind the mill on the 425-foot level and connected to the old workings by a 250-foot raise.

The only definite production figures are as follows:

Year	Ore, tons	Gold		Silver, oz.
		Value	Oz.	
1891		$ 3,150		
1893	7,000	15,000		
1894	14,700	51,450		
1908	800		69.38	15
1909	1,500		107.15	99

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Ref.: 1, pp. 112-114; 2, pp. 189-190; 12, pp. 130, 134; 43, pp. 770-773; 61, 1891, pp. 48-49, 60, 1894, p. 7, 1902, p. 22, 1939 p. 22.

B-46, Calabogia, Silver, Lead, Calabogia District, Lawrence County

The Calabogia property, on Jim Creek 2-1/2 miles northwest of Merrit in the northeast corner of T. 2 N., R. 4 E., is one of the older prospects in the central part of the Black Hills area.

History is very imperfectly known. A shaft was sunk to water at 130 feet before the end of 1891. It had reached a depth of 173 feet by 1907. In 1917, while under lease to Chris Ruth, an unspecified tonnage of lead-silver concentrate was produced. In 1919, 3 tons of previously produced concentrates were sold for $105.30.

The geology has not been described, but the mineralogy suggests that the deposit is a northeast outlier of the jamesonite ores of the Silver City district.

Several other nearby prospects, including the World's Fair, Gold Dust, Fortune, and Buckeye groups, were actively being developed around 1897, but the district failed to reach the productive stage. No production is known, other than that mentioned above.

Ref.: 61, 1891, 1914, 1917, 1919.

B-47, Cuttysark (Blue Talc), Gold, Silver, Mystic District, Pennington County

The Cuttysark mine is 1/2 mile north of Castle Creek and 1 mile from Mystic. It is probably in sec. 4 or 5, T. 1 N., R. 4 E.

Many efforts have been made to develop this property. The most recent owner is Ellis Barker of Rochford, S. Dak.

By 1895 a 120-foot shaft had been sunk. In 1898 the mine was under bond to the Yellow Creek Gold Mining Co., and some development work was done. A 10-stamp mill was evidently on the ground by this time. Lincoln reports no activity since 1902. In 1904 the Cuttysark, the Basil Nos. 1 and 2, the Teddy and the Teddy Nos. 1 and 2 were held by Mr. Tracey of Mystic. In 1911 the mill was moved by Col. J. T. Harrington to the Inca-Fairview mine about 1 mile away. By this time there were four shafts of unknown depth on the property. Mr. Barker apparently considered opening up the property after the price of gold was raised in 1933, but there is no record that anything was actually done.

There is no record of any production from the property.

Ref.: 36, pp. 127-128.

B-48, Inca (Fairview Group), Gold, Silver, Mystic District, Pennington County

Holdings of the Inca Gold Mines, Inc., include the old Inca and Bessie B groups totaling 25 claims in secs. 30 and 31, T. 2 N., R. 4 E. and secs. 4, 5, and 6, T. 1 N., R. 4 E.

Gold occurs in mineralized shear zones cutting pre-Cambrian schists. That on the Inca lode strikes N. 75° W. and dips southwest at 80°. The overall width of the

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zone is about 35 feet, but there are 2 barren streaks, each about 6 feet wide. The ore consists of quartz stringers mineralized with pyrite and arsenopyrite.

Early history is scattered. There was apparently some early production from the Fairview and Inca claims. The group was acquired by J. T. Harrington about 1904, and intermittent mining and development was carried on until 1915. A 10-stamp mill from the Cuttysark mine was moved onto the property in 1911. The old Inca workings, driven mostly before 1904, included a glory hole, a 263-foot main adit with 285 feet of crosscuts in the vein, a 125-foot winze inclined with the ore body at 77°, and a lower 390-foot tunnel beginning during the 1909-15 period of development. In 1937 Inca Gold Mines, Inc., patented the old Fairview claim as the Inca and restaked 12 adjacent claims. A 75-ton flotation mill was built on the Stevens Rockwell No. 4 claim in Pony Gulch, and 1,500 tons of previously mined ore was run through the mill. A concentrate worth $2,500 was reported. Development continued intermittently through 1941.

Ref.: 1, p. 111; 2, pp. 180-181; 36, p. 124.

B-50, Poisoned Ox Group, Copper Glance, Uranium Lode, Gold, Copper, Uranium, Pactola District, Pennington County

A group of 12 unpatented claims, totaling approximately 240 acres, is located in sec. 2, T. 1 N., R. 5 E., about 1 mile northeast of Pactola. Because of the reported occurrence of uranium minerals the property is frequently cited in the literature. It was owned in 1948 by Ray Sanders of Rapid City, S. Dak. It was held for many years in the early part of the century by the McCurdy Brothers of Pactola.

The deposit, which consists of quartz veins and replacement within the pre-Cambrian schists, was actively prospected about 1900. On the Poisoned Ox claim, high on the hillside above Rapid Creek, a silicified zone within the schist strikes N. 40° W. and dips northeast. Ore minerals reported are pyrite, malachite, and azurite. Recent examination reveals several small surface pits, three shafts 10 to 15 feet in depth, and an adit 50 feet long on the Poisoned Ox. Mineralization on the Uranium lode occurs in a crushed and altered zone, which strikes N. 70° W. and dips 65° to 70° northeast. This is developed by an irregular stope or cut along the bank of Rapid Creek, 8 feet high, 30 feet long, and 10 feet wide.

Ref.: 12, p. 211; 36, p. 131; 44, pp. 54, 78.

B-51, Ashley and Nyswanger (Dexter Claim), Copper, Gold, Silver, Pactola District, Pennington County

This prospect consists of 4 unpatented claims in sec. 12, T. 1 N., R. 5 E., about 2 miles southeast of Pactola. It was owned in 1948 by Charles M. Ashley and Lydia Nyswanger of Rapid City, S. Dak.

Prospecting on the Dexter claim has exposed quartz stringers that follow the strike to the schist. The country rock strikes N. 67° E., and dips 60° to 65° to the southeast. The outcrops are badly stained with iron oxide, but some faint copper stains are visible. Gold, silver, and galena have been reported.

Development includes 2 open cuts about 15 feet apart. The east cut is about 30 feet long, in 2 benches, and the other cut is 20 feet long and 5 feet deep at the face. There has been no production from the property.

Ref.: 36, p. 123.

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B-52, Doctor No. 2, Gold, Silver, Redfern District, Pennington County

This group of gold prospects, located in sec. 32, T. 1 N., R. 4 E., about 1 mile from Redfern siding on the Deadwood Branch of the Chicago, Burlington & Quincy Railroad, is owned by R. E. Nelson and F. G. Nelson, Hill City, S. Dak. It includes the Doctor No. 2, the Gold Center, and the Florence lode claims.

Small-scale intermittent placer and lode mining has been carried on since 1929. The only production data available are as follows (it apparently includes the lode mining, but not the placer operations).

1929 - 10 tons ore milled
1949 - 2 tons mined but not milled.

B-53, Divide and Ridge (Mercedes), Gold, Silver, Rochford District, Pennington County

This group, consisting of 12 unpatented claims, lies near the center of sec. 32, T. 2 N., R. 3 E., about 5 miles southwest of Rochford. The last recorded owner is Ed Harding of Rochford.

The ore body is a replacement in a shear zone within the pre-Cambrian schists. Valuable minerals are gold and silver.

The Mercedes was owned by Illinois interests shortly after the turn of the century. By 1905 development included a 100-foot incline on the Apex lode and lesser workings on the Hidden Gem, Apex No. 4, and Apex No. 8 claims. The shaft now has two compartments and is 140 feet in depth.

There has been little activity since 1905, and no production has been recorded from the group.

Ref.: 1, p. 116; 36, p. 133.

B-54, Lookout, Gold, Silver, Unorganized District, Pennington County

The Lookout property, one of the early developments in the Castle Creek area, lies in sec. 1, T. 1 N., R. 3 E., about 3 miles airline west of Mystic.

Early history is lacking. Sometime between 1883 and 1892 the 40-stamp mill of the old Alta Lode Mining Co. (subsequently the Cochrane mine) was moved from Myersville to the Lookout ground on Castle Creek, but there is no record of its operation. Development work was recorded in 1892. In 1900 further work was done, and the property was sold to C. D. Hazzard of Quincyville, Calif. In 1905 it was sold to Charles P. Bishop of Berkeley, Calif., and development done at that time is the last recorded activity on the property.

Ref.: 61, 1892.

B-55, Copper Cliff Co., Graphite, Rochford District, Pennington County

Holdings of the Copper Cliff Co. lay west of Rochford, adjacent to those of the Black Hills Copper Co. and British American Copper Co. The Copper Cliff Co. paid $15,000 in 1901 for claims variously reported to total from 200 to 410 acres. At

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the time of purchase about 300 feet of development tunnels had been driven in an unsuccessful search for copper. Some graphite had been stockpiled in the dump. The first carload of graphite was shipped late in 1901 to Chicago, the general headquarters for the company.

A mill on the property is reported to have run by water power from Rapid Creek.

Ref.: 2, p. 189; 12, p. 211; 44, p. 54; 61, 1902, p. 22.

B-56, Ama Queen, Gold, Silver, Unorganized District, Lawrence County

The Ama Queen Gold Mining Co. originally held 13 unpatented claims centering in secs. 12 and 13, T. 3 N., R. 4 E., in the so-called unknown mining district. The name is a shortening of the Amazon and Queen Isabella lode names.

The company was organized in 1896 by J. C. Sherman of Pactola. A 10-stamp mill was built and limited development work done in a mineralized shear zone cutting the pre-Cambrian schists. By 1907, the last year in which the company was active, a 75-foot shaft and 42 feet of drifting had been completed.

Ref.: 36, pp. 90-91.

B-57, Marigold Mining and Milling Co., Gold, Silver, Rochford District, Pennington County

The Marigold Mining & Milling Co. was organized to develop 40 unpatented claims totaling 800 acres 5 miles west of Rochford. It was incorporated in Delaware in 1933.

Development at that time consisted of 2 shafts, 150 and 50 feet deep, and about 130 feet of drifting.

The ore body is reported by Lincoln to be a fissure vein in broken slate and schist.

A 10-stamp mill, with a capacity of 20 to 25 tons a day, was built in 1935. The mill was started May 1, 1936, and ran for a short time on ore taken from an open cut. It closed down after a short run and remained idle thereafter. The machinery had all been sold from the property by 1941.

Ref.: 36, p. 149.

B-58, Mary Belle, Gold, Silver, Rochford District, Pennington County

The Mary Belle mine is located about a mile west of Rochford, near the mouth of Smith Gulch in the NW1/4 sec. 23, T. 2 N., R. 3 E.

Gold occurs along a shear zone in the pre-Cambrian schist. The prospect was noted for its free gold specimens. Development work was begun in 1900 by the Kerney Brothers of Council Bluffs, Iowa. The Mary Belle, along with the Cyclone group of claims in Castle Creek, was acquired by the Ohio-Deadwood Co. late that same year. These operators began a tunnel into the property from Castle Creek and planned to erect a mill on the north side of the creek to be reached by a trestle from the mine across the creek and the Chicago, Burlington & Quincy Railroad tracks. The tunnel was driven at least 115 feet, but, except for cleaning the ground, nothing was apparently done on the mill. No activity at the property is indicated after 1904.

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Microscopic studies of the ore, made by Carney Soderberg at the South Dakota School of Mines, indicate the following ore minerals: Arsenopyrite, pyrite, pyrrhotite, and chalcopyrite. Gold was apparently associated with the arsenopyrite. Gangue minerals are cummingtonite, quartz, carbonates, biotite, and garnet.

Ref.: 61, 1902, p. 21.

B-59, U. S. Gypsum Co., Gypsum, Unorganized District, Meade County

The United States Gypsum Co. operated a small gypsum mine and mill at Piedmont, S. Dak., until 1948. Both the mine and the plant, which made plaster, were closed in that year and have not been reopened. The property is just north of Piedmont in the NW1/4 sec. 10, T. 3 N., R. 6 E.

The deposit is an extensive bed of gypsum in the Spearfish formation. Near Piedmont the bed is about 20 feet thick and is relatively pure. When freshly mined the gypsum is grayish white, but weathers in a few days to brilliant white.

Development included both open cut and shallow underground room-and-pillar openings. Capacity of the 1-kettle plant was 100 tons of plaster a day.

Ref.: 48, pp. 45-49.

B-60, South Dakota State Cement Plant, Limestone, Shale, Cement, Unorganized District, Pennington County

The South Dakota State Cement Plant at Rapid City is just west of the city in the NW1/4 sec. 33, T 2 N., R. 7 E. This State-owned plant, the only cement plant in South Dakota, produces more than 90 percent of the cement used in the State.

Both limestone and shale are mined in the main pit near the plant. The limestone is the Minnekahta bed; the shale is the underlying Opeche shale. The limestone bed is 35 feet thick, and about 18 feet of the underlying shale is mined after the limestone is removed. Material broken in the pit is loaded with electric shovels and trucked to the plant. Until a few years ago shale for the plant was mined in a small pit in Pierre shale about 5 miles northeast of Rapid City and hauled to the plant by rail.

Output is between 3,000 and 4,000 barrels of finished cement a day, and the entire operation employs about 125 men.

Ref.: 36, pp. 18, 20, 159; 42, pp. 17-33; 61.

B-61, Hills Materials Co., Limestone, Unorganized District, Pennington County

The Hills Materials Co., a subsidiary of the Northwestern Engineering Co. of Rapid City, operates a large limestone quarry about 2-1/2 miles west of Rapid City.

Development is by a large open-pit adjacent to U. S. Highway 14. Limestone from the pit is crushed, screened, and sized for construction work and for use as road material in the Rapid City area. Equipment in both the pit and the screening plant is modern and efficient. Output varies but usually is several thousand tons a day.

The deposit is the Minnekahta limestone.

Ref.: 61.

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B-62, Dakota Lime and Brick Co., Limestone, Unorganized District, Pennington County

The Dakota Lime & Brick Co. operates a lime quarry and concrete block plant about 2 miles west of Rapid City in the NE1/4 sec. 28, T. 2 N., R. 6 E. This company supplies almost all of the lime used in the Black Hills area, as well as most of the concrete block and brick.

The deposit, developed by a large quarry, is the 30-foot bed of Minnekahta limestone. Annual production is approximately 3,000 tons.

The lime plant has three 8-foot kilns fired with natural gas.

Ref.: 36, p. 127; 61.

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